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# Factors associated with the frequency of turnover intention among hospital nurses in Japan: an ordinal logistic regression analysis

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## Abstract

# Background

Nurse turnover significantly affects healthcare systems worldwide, particularly in aging societies such as Japan. Although workplace harassment, workload, and sickness presenteeism are known contributors to nurses' turnover intention, most studies have conceptualized turnover intention as a binary outcome. This study examined factors associated with turnover intention frequency among hospital nurses in Japan using an ordinal approach.

# Methods

A nationwide cross-sectional, web-based survey was conducted in March 2025 among nurses employed in hospitals with 20 or more inpatient beds. Data from 625 responses were analyzed to assess turnover intention, defined as the frequency of considering leaving the current hospital during the past year (five-level ordinal scale). Explanatory variables included experiences of workplace harassment (from patients/families, coworkers, supervisors, and other staff), perceived busyness, sickness presenteeism, workplace safety measures, psychological safety, and socio-demographic and work-related characteristics. Sickness presenteeism was assessed using a validated Japanese presenteeism scale and converted to a 0%–100% productivity loss score. Factors associated with higher frequencies of turnover intention were identified by multivariable ordinal logistic regression analysis.

# Results

Higher sickness presenteeism (odds ratio [OR] = 1.019, 95% confidence interval [CI] = 1.011–1.027) and greater perceived busyness (OR = 1.278, 95% CI = 1.179–1.385) were independently associated with higher turnover intention frequency. A dose–response relationship was observed between turnover intention and experiences of workplace harassment. Compared with nurses reporting no harassment, those who experienced harassment on two to four instances had significantly higher odds of frequent turnover intention (ORs = 1.94–2.27). Psychological safety was not significantly associated with turnover intention after adjustment. Nurses without caregiving responsibilities were more likely to report frequent turnover intention (OR = 1.97, 95% CI = 1.10–3.53).

# Conclusions

Turnover intention among hospital nurses should be examined as a graded process rather than a binary outcome. Sickness presenteeism, perceived busyness, and cumulative workplace harassment were significantly associated with more frequent consideration of leaving. Early identification of productivity loss and excessive workload, along with comprehensive strategies to prevent repeated harassment, may be essential for retaining the nursing workforce.

## Background

Nursing shortages are occurring globally. As emphasized by the World Health Organization [1], the recruitment and retention of nurses are critical to the sustainability of health care systems worldwide. In Japan, with its unprecedented population aging rate, the demand for medical and long-term care services increases inexorably, making the retention of nursing professionals an urgent priority [2, 3]. Although the number of employed nurses in Japan has risen to approximately 1.7 million [4], workforce shortages persist across healthcare facilities [5]. Furthermore, the annual turnover rate among newly graduated nurses is approximately 10%, while the overall annual turnover rate is approximately 12% [5]. These figures highlight the importance of not only strengthening nursing education but also implementing effective strategies to prevent turnover after employment [5, 6].

Furthermore, interpersonal relationships and organizational culture crucially influence nurses' intentions to stay or leave the workplace [7, 8]. In particular, workplace violence and harassment have attracted increasing attention due to their significant effects on nurses' physical and psychological health and their decision to remain [9–11].

Legislative revisions enacted in Japan in 2019 mandate employers to implement measures preventing workplace harassment [12, 13]. In healthcare settings, harassment may occur not only among nurses or between supervisors and subordinates, but also across professional groups and with patients or their family members. Previous studies have shown that nurses' experiences of harassment are associated with burnout, reduced work productivity due to health problems (sickness presenteeism), and increased turnover intention [14].

Various interventions have been introduced to address workplace harassment, including individual-focused approaches, such as early recognition of violent behavior, de-escalation techniques, and cognitive rehearsal training, and organizational measures, such as policy development and management education [15]. Furthermore, establishing a workplace culture that fosters psychological safety significantly prevents harassment and promotes nursing workforce retention [16, 17].

However, few studies have comprehensively examined multiple harassment experiences of nurses while simultaneously considering workplace safety measures and psychological safety. Moreover, previous investigations on sickness presenteeism and turnover intention have often assessed turnover intention as a binary outcome, despite evidence indicating that the frequency or severity of such intentions may vary substantially across individuals [18, 19]. Few studies have conceptualized turnover intention as a graded process and identified factors associated with stronger or more frequent turnover intention [20, 21]. Therefore, this study employed an ordinal approach to assess the frequency of turnover intention among hospital nurses in Japan and clarify its associations with workplace harassment, working conditions, workplace environment, and sickness presenteeism.

# Methods

Design and data collection

This study conducted a nationwide cross-sectional, web-based survey in Japan in March 2025. The inclusion criteria for participant recruitment included working at a hospital with 20 or more inpatient beds and at least 1

year of employment at their current workplace. Sample size calculations were performed using G*Power3. Assuming multiple regression analysis conducted with an effect size $f^2 = 0.15$, $\alpha = 0.05$, 95% power, and 20 independent variables, the required sample size was calculated to be 222 cases. Considering the possibility of performing subgroup analyses based on hospital size, the total sample size was set at 600 participants.

Participants were recruited from a research company's online panel. Panel members who received an invitation were provided with information about the study. Those who voluntarily agreed to participate were included. Incentives were provided by the research company in accordance with its standard panel policy.

This study was conducted after receiving approval from the Research Ethics Committee of Kawasaki City College of Nursing (Approval Number: 24–024; Approval Date: March 19, 2025).

Measures

The questionnaire items were designed based on the conceptual model shown in the figure.

Participants were asked whether they had experienced harassment in their current workplace, such as from patients or their families, fellow nurses, supervisors, and other non-nursing staff. Harassment was described as acts that obstruct legitimate medical procedures, including verbal abuse, physical violence, sexual remarks, bullying, and harassment. Such acts may be carried out against the respondents by patients or their families, colleagues, superiors, or other staff members.

Figure 1. Conceptual framework of factors associated with turnover intention among hospital nurses in Japan

In this study, turnover intention was defined as nurses' intention to leave their current hospital. The outcome was measured with the question, "Have you ever considered leaving your current workplace within the past year?" Responses were recorded on a five-point ordinal scale: never, rarely, about once a month, about once a week, and daily.

Factors related to changes in retirement intentions included work conditions, respondent personal attributes, and sickness presenteeism. The work status questionnaire evaluated hospital size, work section, overtime level (7-point scale), perceived busyness (11-point scale), job position, and annual income level. The demographic variables included sex, age, marital status, education level, living with infants or young children, and living with individual requiring care.

Sickness presenteeism was assessed using a validated Japanese presenteeism scale that measures health-related productivity loss while working [22]. This seven-item scale evaluates difficulties in work functioning due to physical or psychological health problems, including reduced concentration, decreased work pace or volume, increased need for rest, mistakes at work, and difficulties in workplace communication during the past month. Each item was rated on a four-point Likert scale (from 1 = never to 4 = often). Item scores were summed to obtain the total score, which was subsequently converted to a 0%–100% scale indicating the degree of productivity loss. Higher scores indicate greater levels of sickness presenteeism. The converted score was subsequently analyzed as a continuous variable.

The assessment of factors mitigating the intention to leave included questions on workplace safety measures and workplace psychological and physical safety. On workplace safety measures, respondents were asked of

nurses' knowledge of hospital policy regarding the following four items: conducting role-playing–based communication training to prevent workplace violence and similar incidents; establishing a system for preventing violence and similar incidents by deploying security personnel; ensuring availability of escape routes to safe locations in the event of violence or similar incidents; and distributing a manual describing countermeasures for violence and similar incidents to all staff to ensure awareness.

Psychological safety was measured using the Japanese version of the Survey Measure of Psychological Safety, originally developed by O'Donovan et al. [23]. The 19-item scale is divided into three subscales: psychological safety related to team leader (9 items), peers (7 items), and team (3 items). All items were rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating greater psychological safety. The good construct validity and excellent internal consistency of the Japanese version has been demonstrated in previous studies [24].

All variables were analyzed using descriptive statistics on SPSS version 29.0. Bivariate associations between each explanatory variable and the ordinal levels of intention to leave were examined. Subsequently, multivariable ordinal logistic regression analyses were performed to identify factors associated with higher levels of intention to leave. A two-tailed p-value < 0.05 was considered statistically significant. The proportional odds assumption was examined using the test of parallel lines, and no substantial violation was detected.

# Results

### Characteristics of participants and intention to leave.

In total, responses from 625 nurses were analyzed. The socio-demographic characteristics of the participants and their frequency of considering leaving are shown in Table 1. Most participants were female (82.6%), and the 40s (37.8%) and 50s (30.4%) age groups were the largest.

The frequency of considering leaving the hospital differed significantly with age group ($p = 0.028$). However, no significant differences were observed in sex, marital status, educational background, or the presence of preschool children in the household.

Table 1 here.

Table 1
Socio-demographic characteristics of nurses (n = 625)

| Variables | Category | Number | Frequency of considering leaving the workplace | | | | | P value |
|---|---|---|---|---|---|---|---|---|
| | | % | Never | Rarely | About once a month | About once a week | Every day | |
| | | | Number | Number | Number | Number | Number | |
| | | | % | % | % | % | % | |
| Sex | Male | 102 | 23 | 52.0 | 10.0 | 4.0 | 13.0 | 0.028 a |
| | | 16.3 | 22.5 | 51.0 | 9.8 | 3.9 | 12.7 | |
| | Female | 516 | 63 | 239.0 | 64.0 | 60.0 | 90.0 | |
| | | 82.6 | 12.2 | 46.3 | 12.4 | 11.6 | 17.4 | |
| | Don't want to answer | 7 | 0 | 3.0 | 1.0 | 1.0 | 2.0 | |
| | | 1.1 | 0.0 | 42.9 | 14.3 | 14.3 | 28.6 | |
| Age | 20s | 34 | 5 | 15 | 5 | 4 | 5 | 0.194 b |
| | | 5.4 | 14.7 | 44.1 | 14.7 | 11.8 | 14.7 | |
| | 30s | 105 | 9 | 45 | 14 | 13 | 24 | |
| | | 16.8 | 8.6 | 42.9 | 13.3 | 12.4 | 8.6 | |
| | 40s | 236 | 26 | 111 | 28 | 27 | 44 | |
| | | 37.8 | 11.0 | 47.0 | 11.9 | 11.4 | 11.0 | |
| | 50s | 190 | 38 | 86 | 23 | 17 | 26 | |
| | | 30.4 | 20.0 | 45.3 | 12.1 | 8.9 | 20.0 | |
| | 60s | 60 | 8 | 37 | 5 | 4 | 6 | |
| | | 9.6 | 13.3 | 61.7 | 8.3 | 6.7 | 13.3 | |
| Marital status | Unmarried | 287 | 38 | 127 | 35 | 32 | 55 | 0.549 b |
| | | 45.9 | 13.2 | 44.3 | 12.2 | 11.1 | 19.2 | |
| | Married | 338 | 48 | 167 | 40 | 33 | 50 | |
| | | 54.1 | 14.2 | 49.4 | 11.8 | 9.8 | 14.8 | |
| Presence of preschool children in the home | None | 539 | 78 | 253 | 63 | 56 | 89 | 0.743 b |
| | | 86.2 | 14.5 | 46.9 | 11.7 | 10.4 | 16.5 | |

a: Fisher's exact test

b: $\chi 2$ test

| Variables | Category | Number | Frequency of considering leaving the workplace | | | | | P value |
|---|---|---|---|---|---|---|---|---|
| | | % | Never | Rarely | About once a month | About once a week | Every day | |
| | | | Number % | Number % | Number % | Number % | Number % | |
| | Presence | 86 | 8 | 41 | 12 | 9 | 16 | |
| | | 13.8 | 9.3 | 47.7 | 14.0 | 10.5 | 18.6 | |
| Presence of a person requiring care in the home | None | 575 | 77 | 268 | 69 | 59 | 102 | 0.298 b |
| | | 92.0 | 13.4 | 13.4 | 13.4 | 13.4 | 13.4 | |
| | Presence | 50 | 9 | 26 | 6 | 6 | 3 | |
| | | 8.0 | 18.0 | 52.0 | 12.0 | 12.0 | 6.0 | |
| Education | Vocational school | 481 | 67 | 225 | 53 | 51 | 85 | 0.93 b |
| | | 77.0 | 13.9 | 13.9 | 13.9 | 13.9 | 13.9 | |
| | Junior college | 46 | 7 | 22 | 7 | 4 | 6 | |
| | | 7.4 | 15.2 | 47.8 | 15.2 | 8.7 | 13.0 | |
| | 4-year university | 98 | 12 | 47 | 15 | 10 | 14 | |
| | | 15.7 | 12.2 | 48.0 | 15.3 | 10.2 | 14.3 | |
| a: Fisher's exact test | | | | | | | | |
| b: $\chi 2$ test | | | | | | | | |

## Hospital and work-related characteristics

Hospital- and work-related information on the participants is presented in Table 2. More than half of the nurses worked in general wards (60.2%), while approximately two-thirds were engaged in shift work (61.3%).

Workplace harassment was prevalent, with 56.6% of respondents reporting harassment from patients or their families, 36.6% from coworkers, and 37.0% from superiors. Nurses experiencing harassment from coworkers, superiors, or other non-nursing staff reported a significantly higher frequency of turnover intention (all $p < 0.001$). However, hospital-level preventive measures, such as the deployment of security guards, were not significantly associated with intention to leave.

Table 2 here

Table 2
Hospital and work situation of nurses (n = 625)

| Variables | Category | Number<br>% | Frequency of considering leaving the hospital | | | | | |
|---|---|---|---|---|---|---|---|---|
| Never | Rarely | About once a month | About once a week | Every day | P value | | | |
| Number<br>% | Number<br>% | Number<br>% | Number<br>% | Number | | | | |
| Hospital size | 20–99 beds | 94 | 8 | 50 | 14 | 7 | 15 | 0.208 c |
| | | 15.0 | 8.5 | 53.2 | 14.9 | 7.4 | 16 | |
| | 100–199 beds | 168 | 25 | 84 | 14 | 20 | 25 | |
| | | 26.9 | 14.9 | 50.0 | 8.3 | 11.9 | 14.9 | |
| | 200–299 beds | 90 | 13 | 35 | 11 | 6 | 25 | |
| | | 14.4 | 14.4 | 38.9 | 12.2 | 6.7 | 27.8 | |
| | 300–399 beds | 88 | 15 | 41 | 9 | 12 | 11 | |
| | | 14.1 | 17.0 | 46.6 | 10.2 | 13.6 | 12.5 | |
| | ≥ 400 beds | 185 | 25 | 84 | 27 | 20 | 29 | |
| | | 29.6 | 13.5 | 45.4 | 14.6 | 10.8 | 15.7 | |
| Employment | Regular employment | 565 | 81 | 262 | 66 | 62 | 94 | 0.351 c |
| | | 90.4 | 14.3 | 46.4 | 11.7 | 11.0 | 16.6 | |
| | Non-regular employment | 60 | 5 | 32 | 9 | 3 | 11 | |
| | | 9.6 | 8.3 | 53.3 | 15.0 | 5.0 | 18.3 | |
| Working unit | Outpatient Department | 86 | 15 | 49 | 6 | 11 | 5 | 0.351 c |
| | | 13.8 | 17.4 | 57.0 | 7.0 | 12.8 | 5.8 | |
| | Operating Room | 25 | 2 | 8 | 8 | 4 | 3 | |
| | | 4.0 | 8.0 | 32.0 | 32.0 | 16.0 | 12.0 | |
| | High-Care Unit | 36 | 5 | 23 | 4 | 3 | 1 | |
| | | 5.8 | 13.9 | 63.9 | 11.1 | 8.3 | 2.8 | |

c: Fisher's exact test

d: $\chi 2$ test

| Variables | Category | Number<br>% | Frequency of considering leaving the hospital | | | | | |
|---|---|---|---|---|---|---|---|---|
| | General Ward | 376 | 47 | 160 | 44 | 40 | 85 | |
| | | 60.2 | 12.5 | 42.6 | 11.7 | 10.6 | 22.6 | |
| | Others | 102 | 17 | 54 | 13 | 7 | 11 | |
| | | 16.3 | 16.7 | 52.9 | 12.7 | 6.9 | 10.8 | |
| Working shift | Day shift only | 212 | 32 | 106 | 16 | 24 | 34 | 0.269 c |
| | | 33.9 | 15.8 | 52.5 | 7.9 | | 16.8 | |
| | Night shift only | 16 | 1 | 10 | 4 | 0 | 1 | |
| | | 2.6 | 6.3 | 62.5 | 25.0 | | 6.3 | |
| | Shift work | 383 | 51 | 172 | 52 | 39 | 69 | |
| | | 61.3 | 13.3 | 44.9 | 13.6 | | 18 | |
| | Others | 14 | 2 | 6 | 3 | 2 | 1 | |
| | | 2.2 | 14.3 | 42.9 | 21.4 | | 7.1 | |
| Salary level | 2 million to less than 3 million yen | 67 | 9 | 33 | 3 | 5 | 17 | 0.096 c |
| | | 10.7 | 13.4 | 49.3 | 4.5 | | 25.4 | |
| | 3 million to less than 4 million yen | 99 | 10 | 45 | 9 | 14 | 21 | |
| | | 15.8 | 10.1 | 45.5 | 9.1 | | 21.2 | |
| | 4 million to less than 5 million yen | 149 | 17 | 74 | 15 | 12 | 31 | |
| | | 23.8 | 11.4 | 49.7 | 10.1 | | 20.8 | |
| | 5 million to less than 6 million yen | 170 | 25 | 83 | 23 | 19 | 20 | |
| | | 27.2 | 14.7 | 48.8 | 13.5 | | 11.8 | |
| | 6 million to less than 7 million yen | 75 | 12 | 38 | 12 | 6 | 7 | |
| | | 12.0 | 16.0 | 50.7 | 16.0 | | 9.3 | |
| c: Fisher's exact test | | | | | | | | |
| d: $\chi 2$ test | | | | | | | | |

| Variables | Category | Number<br>% | Frequency of considering leaving the hospital | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 7 million to less than 8 million yen | 43 | 9 | 12 | 8 | 7 | 7 | |
| | | 6.9 | 20.9 | 27.9 | 18.6 | | 16.3 | |
| | 8 million yen or more | 22 | 4 | 9 | 5 | 2 | 2 | |
| | | 3.5 | 18.2 | 40.9 | 22.7 | | 9.1 | |
| Average overtime hours/month | None | 62 | 12 | 32 | 4 | 6 | 8 | 0.018 c |
| | | 9.9 | 19.4 | 51.6 | 6.5 | | 2.9 | |
| | 0–4 hours | 231 | 31 | 119 | 27 | 22 | 32 | |
| | | 37.0 | 13.4 | 51.5 | 11.7 | | 13.9 | |
| | 5–9 hours | 136 | 24 | 63 | 10 | 12 | 27 | |
| | | 21.8 | 17.6 | 46.3 | 7.4 | | 19.9 | |
| | 10–19 hours | 125 | 12 | 56 | 21 | 17 | 19 | |
| | | 20.0 | 9.6 | 44.8 | 16.8 | | 15.2 | |
| | 20–29 hours | 34 | 4 | 15 | 8 | 3 | 4 | |
| | | 5.4 | 11.8 | 44.1 | 23.5 | | 11.8 | |
| | 30–39 hours | 21 | 1 | 6 | 3 | 2 | 9 | |
| | | 3.4 | 4.8 | 28.6 | 14.3 | | 42.9 | |
| | ≥ 40 hours | 16 | 2 | 3 | 2 | 3 | 6 | |
| | | 2.6 | 12.5 | 18.8 | 12.5 | 18.8 | 37.5 | |
| Experience of harassment at current workplace | Harassment from patients and their families | 354 | 38 | 157 | 44 | 41 | 74 | 0.003 d |
| | | 56.6 | 10.7 | 44.4 | 12.4 | 11.6 | 20.9 | |
| | Harassment from coworkers | 229 | 11 | 98 | 34 | 34 | 52 | < 0.001d |
| | | 36.6 | 4.8 | 42.8 | 14.8 | 14.8 | 22.7 | |
| c: Fisher's exact test | | | | | | | | |
| d: $\chi 2$ test | | | | | | | | |

| Variables | Category | Number<br>% | Frequency of considering leaving the hospital | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Harassment from superiors | 231 | 17 | 93 | 32 | 35 | 54 | < 0.001 d |
| | | 37.0 | 7.4 | 40.3 | 13.9 | 15.2 | 23.4 | |
| | Harassment from other professions | 152 | 12 | 64 | 15 | 20 | 41 | < 0.001 d |
| | | 24.6 | 7.9 | 42.1 | 9.9 | 13.2 | 27.0 | |
| Status of hospitals' implementation of harassment prevention measures | Training incorporating role-playing | 87 | 17 | 47 | 11 | 0 | 12 | 0.006 c |
| | | 13.9 | 19.5 | 54.0 | 12.6 | 0 | 13.8 | |
| | Security guard deployment and patrols | 186 | 30 | 94 | 19 | 17 | 26 | 0.398 d |
| | | 29.8 | 16.1 | 50.5 | 10.2 | 90 | 14 | |
| | Established evacuation routes in the event of violence | 90 | 16 | 49 | 9 | 5 | 11 | 0.165 d |
| | | 14.4 | 17.8 | 54.4 | 10.0 | 5.6 | 12.2 | |
| | Disseminating the violence response manual | 230 | 39 | 118 | 28 | 16 | 29 | 0.017 d |
| | | 36.8 | 17.0 | 51.3 | 12.2 | 7.0 | 12.6 | |
| Frequency of considering leaving the hospital | Never | 86 | - | - | - | - | - | |
| | | 13.8 | | | | | | |
| | Rarely | 294 | - | - | - | - | - | |
| | | 47.0 | | | | | | |
| | About once a month | 75 | - | - | - | - | - | |
| | | 12.00 | | | | | | |
| | About once a | 65 | - | - | - | - | - | |

c: Fisher's exact test

d: $\chi 2$ test

| Variables | Category | Number<br>% | Frequency of considering leaving the hospital | | | | |
|---|---|---|---|---|---|---|---|
| | week | | | | | | |
| | | 10.4 | | | | | |
| | Every day | 105 | - | - | - | - | - |
| | | 16.8 | | | | | |
| c: Fisher's exact test | | | | | | | |
| d: χ2 test | | | | | | | |

## Descriptive statistics of key variables

Table 3 presents the descriptive statistics for perceived busyness, psychological safety, and presenteeism. The mean perceived busyness score was 7.29 (standard deviation [SD] = 2.07) on a 0–10 scale. Mean psychological safety scores ranged from 4.72 to 4.92 across the peer, team leader, and team subscales.

Tabel 3 here

Table 3
Perceived busyness, Workplace Safety Scale, and sickness presenteeism (n = 625)

| Variables | Mean | S.D. | Median | Minimum | Maximum |
|---|---|---|---|---|---|
| Perceived busyness | 7.3 | 2.1 | 7.0 | 0 | 10 |
| Psychological safety scale | | | | | |
| Peers | 4.9 | 1.4 | 5.0 | 1 | 7 |
| Team leader | 4.7 | 1.4 | 4.7 | 1 | 7 |
| Team | 4.8 | 1.5 | 5.0 | 1 | 7 |
| Presenteeism | 32.6 | 21.8 | 38.1 | 0 | 100 |

Perceived busyness: Respondents were asked to rate their perceived busyness

on an 11-point scale from 0 to 10 (not busy to extremely busy)

Psychological safety scale: Japanese Version of O'Donovan et al.'s "Composite measure of psychological safety in healthcare teams."

S.D.: standard deviation

As shown in Table 4, 80.6% of participants reported at least one physical or psychological symptom. The most frequently reported symptoms were stiff shoulders (53%), lower back pain (49%), headache (41%), and

depressive symptoms (35%), with some participants reporting multiple symptoms. The mean score for sickness presenteeism caused by these symptoms was 32.6 %(SD = 21.8).

Table 4 here

Table 4
Symptoms felt by nurses (n = 625)

| Symptoms | Number | % |
|---|---|---|
| Symptoms present | 504 | 80.6 |
| Difficulty seeing | 195 | 31.2 |
| Difficulty hearing | 92 | 14.7 |
| Joint pain | 153 | 24.5 |
| Weakness in the limbs | 148 | 23.7 |
| Lower back pain | 309 | 49.4 |
| Stiff shoulders | 332 | 53.1 |
| Headache | 254 | 40.6 |
| Stomach/abdominal pain | 168 | 26.9 |
| Insomnia | 181 | 29.0 |
| Depression | 216 | 34.6 |
| Itchy or sore skin | 151 | 24.2 |
| Constipation or diarrhea | 209 | 33.4 |
| Nausea or loss of appetite | 73 | 11.7 |
| Hot flashes or chills | 73 | 11.7 |
| Other | 14 | 2.2 |
| No symptoms | 121 | 19.4 |

Multiple symptoms can be mentioned by each respondent.

## Factors associated with the frequency of intention to leave

The results of the ordinal logistic regression analysis of the factors associated with the frequency of turnover intention are shown in Table 5.

Higher presenteeism (OR = 1.019, 95% CI = 1.011–1.027, $p < 0.001$) and greater perceived busyness were significantly associated with a higher frequency of turnover intention (OR = 1.278, 95% CI = 1.179–1.385, $p < 0.001$).

A dose–response relationship was observed between experiences of workplace harassment and intention to leave. Compared with nurses who reported no harassment, those who experienced harassment on two, three, or four occasions had significantly higher odds of turnover intention (OR = 1.94–2.27).

In contrast, psychological safety was not significantly associated with intention to leave after adjustment for other variables. Compared with nurses living with a person requiring care, those without a cohabiting care recipient had significantly higher odds of more frequent turnover intention (OR = 1.97, 95% CI = 1.10–3.53).

Table 5 here

Table 5
Ordinal logistic regression analysis of factors associated with frequency of intention to leave among nurses”

| Variable | Category | β | S.E. | Wald | P-value | OR | 95% CI | |
|---|---|---|---|---|---|---|---|---|
| Sickness Presenteeism | Continuous | 0.019 | 0.004 | 25.06 | < .001 | 1.019 | 1.011 | 1.027 |
| Perceived busyness | Continuous | 0.245 | 0.041 | 35.829 | < .001 | 1.278 | 1.179 | 1.385 |
| Psychological safety scale | | | | | | | | |
| Peer | Continuous | -0.191 | 0.111 | 2.968 | 0.085 | 0.826 | 0.665 | 1.027 |
| Team Leader | Continuous | -0.011 | 0.094 | 0.015 | 0.088 | 0.989 | 0.823 | 1.189 |
| Team | Continuous | -0.158 | 0.093 | 2.905 | 0.088 | 0.854 | 0.712 | 1.025 |
| Hospital size | | | | | | | | |
| 20–99 beds | | -0.121 | 0.293 | 0.17 | 0.680 | 0.886 | 0.499 | 1.573 |
| 100–199 beds | | -0.339 | 0.239 | 2.015 | 0.156 | 0.712 | 0.446 | 1.138 |
| 200–299 beds | | 0.339 | 0.265 | 1.641 | 0.200 | 1.404 | 0.835 | 2.359 |
| 300–399 beds | | -0.245 | 0.264 | 0.856 | 0.355 | 0.783 | 0.467 | 1.313 |
| ≥ 400 beds | Reference | . | . | . | . | 1.000 | | |
| Experience of harassment at current workplace | | | | | | | | |
| Four instances | | 0.82 | 0.281 | 8.498 | 0.004 | 2.270 | 1.309 | 3.938 |
| Three instances | | 0.662 | 0.253 | 6.828 | 0.009 | 1.939 | 1.181 | 3.183 |
| Two instances | | 0.803 | 0.241 | 11.059 | < .001 | 2.232 | 1.392 | 3.580 |
| One instances | | 0.313 | 0.216 | 2.093 | 0.148 | 1.368 | 0.896 | 2.088 |
| None | Reference | . | . | . | . | 1.000 | | |
| Sex | | | | | | | | |
| Male | | -0.884 | 0.774 | 1.305 | 0.253 | 0.413 | 0.091 | 1.883 |
| Female | | -0.184 | 0.75 | 0.06 | 0.806 | 0.832 | 0.191 | 3.618 |
| Don't want to answer | Reference | . | . | . | . | 1.000 | | |
| Age | | | | | | | | |
| 20s | | -0.228 | 0.474 | 0.231 | 0.631 | 0.796 | 0.314 | 2.016 |
| 30s | | 0.276 | 0.373 | 0.546 | 0.460 | 1.318 | 0.634 | 2.738 |
| 40s | | 0.017 | 0.304 | 0.003 | 0.956 | 1.017 | 0.561 | 1.846 |

| Variable | Category | β | S.E. | Wald | P-value | OR | 95% CI | |
|---|---|---|---|---|---|---|---|---|
| 50s | | -0.319 | 0.306 | 1.081 | 0.298 | 0.727 | 0.399 | 1.324 |
| 60s | Reference | . | . | . | . | 1.000 | | |
| Marital status | | | | | | | | |
| Unmarried | | 0.176 | 0.176 | 1.005 | 0.316 | 1.192 | 0.845 | 1.684 |
| Married | Reference | . | . | . | . | 1.000 | | |
| Presence of preschool children in the home | | | | | | | | |
| None | | -0.178 | 0.284 | 0.393 | 0.53 | 0.837 | 0.480 | 1.460 |
| Presence | Reference | . | . | . | . | 1.000 | | |
| Presence of a person requiring care living in the home | | | | | | | | |
| None | | 0.678 | 0.298 | 5.181 | 0.023 | 1.970 | 1.098 | 3.533 |
| Presence | Reference | . | . | . | . | 1.000 | | |
| Annual income (million yen) | | | | | | | | |
| 2–<3 | | 0.133 | 0.536 | 0.062 | 0.804 | 1.142 | 0.399 | 3.266 |
| 3–<4 | | 0.408 | 0.479 | 0.727 | 0.394 | 1.504 | 0.588 | 3.845 |
| 4–<5 | | 0.263 | 0.458 | 0.33 | 0.566 | 1.301 | 0.530 | 3.192 |
| 5–<6 | | 0.287 | 0.451 | 0.404 | 0.525 | 1.332 | 0.550 | 3.225 |
| 6-<7 | | 0.017 | 0.48 | 0.001 | 0.971 | 1.017 | 0.397 | 2.606 |
| 7-<8 | | 0.516 | 0.518 | 0.995 | 0.319 | 1.675 | 0.607 | 4.624 |
| ≥ 8 | Reference | . | . | . | . | 1.000 | | |
| Education | | | | | | | | |
| Vocational school | | 0.156 | 0.241 | 0.42 | 0.517 | 1.169 | 0.729 | 1.875 |
| Junior college | | -0.103 | 0.369 | 0.078 | 0.780 | 0.902 | 0.438 | 1.859 |
| 4-year university | | . | . | . | . | 1.000 | | |
| Regular Employment or Not | | | | | | | | |
| Regular | | -0.384 | 0.331 | 1.339 | 0.247 | 0.681 | 0.356 | 1.303 |
| Non-regular | Reference | . | . | . | . | 1.000 | | |

| Variable | Category | β | S.E. | Wald | P-value | OR | 95% CI | |
|---|---|---|---|---|---|---|---|---|
| Working unit | | | | | | | | |
| Outpatient Department | | -0.294 | 0.304 | 0.936 | 0.333 | 0.745 | 0.411 | 1.352 |
| Operating Room | | 0.837 | 0.453 | 3.418 | 0.064 | 2.309 | 0.950 | 5.612 |
| High-Care Unit | | -0.147 | 0.406 | 0.132 | 0.717 | 0.863 | 0.390 | 1.913 |
| General Ward | | 0.429 | 0.242 | 3.156 | 0.076 | 1.536 | 0.956 | 2.468 |
| Others | Reference | . | . | . | . | 1.000 | | |
| Working shift | | | | | | | | |
| Day shift only | | 0.14 | 0.55 | 0.065 | 0.799 | 1.150 | 0.391 | 3.380 |
| Night shift only | | 0.154 | 0.727 | 0.045 | 0.832 | 1.166 | 0.281 | 4.850 |
| Shift work | | 0.131 | 0.55 | 0.057 | 0.811 | 1.140 | 0.388 | 3.350 |
| Others | Reference | . | . | . | . | 1.000 | | |
| Training incorporating role-playing | | | | | | | | |
| None | | 0.365 | 0.246 | 2.198 | 0.138 | 1.441 | 0.889 | 2.333 |
| Implementation | Reference | . | . | . | . | 1.000 | | |
| Security guard deployment and patrols | | | | | | | | |
| None | | 0.389 | 0.199 | 3.821 | 0.051 | 1.476 | 0.999 | 2.179 |
| Implementation | Reference | . | . | . | . | 1.000 | | |
| Established evacuation routes in the event of violence | | | | | | | | |
| None | | 0.194 | 0.254 | 0.586 | 0.444 | 1.214 | 0.738 | 1.997 |
| Implementation | Reference | . | . | . | . | 1.000 | | |
| Disseminating the violence response manual | | | | | | | | |
| None | | 0.067 | 0.196 | 0.116 | 0.733 | 1.069 | 0.728 | 1.570 |
| Implementation | Reference | . | . | . | . | 1.000 | | |

Dependent variable: Five ordinal levels of the frequency of intention to leave.

Presenteeism is converted to 0%–100% scale.

Psychological Safety Scale – Japanese Version of O'Donovan et al.'s "Composite measure of psychological safety in healthcare teams."

Perceived busyness: Respondents were asked to rate their perceived busyness on an 11-point scale from 0 to 10 (not busy to extremely busy)

Reference categories are indicated as “Reference”. ORs greater than 1 indicate higher odds of more frequent turnover intention.

S.E.:Standard error

# Discussion

This study used an ordinal approach to examine the frequency and factors contributing to nurses’ intention to leave their current workplace. Sickness presenteeism, perceived busyness, and cumulative experiences of workplace harassment were independently associated with a higher frequency of considering leaving the hospital, even after adjusting for socio-demographic characteristics, work-related factors, and workplace safety measures. In particular, the observed dose–response relationship between the frequency of harassment experience and turnover intention indicates that repeated exposure to hostile work environments progressively intensifies nurses’ psychological disengagement from their workplace. Thus, emphatically, nurses’ turnover intention should be understood not as a binary outcome, but as a graded process influenced by declining work functioning and accumulated occupational stress.

The emergence of sickness presenteeism as a key factor associated with higher frequencies of turnover intention reflects a workplace where nurses are compelled to work despite health problems, causing reduced work functioning. The present findings further indicate that nurses experiencing greater productivity loss due to health issues are more likely to consider leaving more frequently. Thus, presenteeism may be an early warning signal preceding actual turnover. This interpretation is consistent with previous studies reporting an association between presenteeism and burnout, reduced job satisfaction, or subsequent intentions to leave among healthcare workers [25]. From an organizational perspective, these results demonstrate the importance of addressing health-related productivity loss not only as an individual well-being issue, but also as a critical component of workforce retention [26, 27].

The link between perceived busyness and higher levels of turnover intention highlighted the role of cognitive and subjective workload in nurses’ decisions to stay. Unlike objective indicators, such as overtime hours, perceived busyness reflects individual appraisal of work demands relative to available time, resources, and personal capacity [28]. This subjective burden may cause sustained mental fatigue and reduce coping capacity, thereby increasing the likelihood of working while unwell, thus amplifying sickness presenteeism. Thus, perceived busyness and presenteeism may operate in a synergistic cycle in which excessive cognitive load undermines health-related functioning, thereby reinforcing intentions to leave the profession or workplace. These results imply that effective workload management must address not only staffing levels and working hours but also nurses’ perceptions of task complexity, time pressure, and role expectations [29, 30].

Cumulative exposure to workplace harassment showed a strong dose–response relationship with turnover intention, underscoring the profound impact of recurring hostile interactions in healthcare settings. Turnover

intention frequency intensified not just with the mere presence of harassment but especially with the accumulation of multiple incidents [31]. This pattern indicates that recurrent harassment may erode nurses' psychological resources over time, driving disengagement and diminishing the capacity to sustain professional commitment .[32, 33] Importantly, the persistence of this association after adjustment for workplace safety measures demonstrates that individual incidents cannot be fully mitigated by isolated preventive actions alone. Instead, these findings emphasize the need for comprehensive organizational approaches that build a culture of zero tolerance toward harassment, promote early recognition of repeated exposure, and integrate both structural safeguards and supportive leadership practices to protect nurses from chronic occupational harm [34].

Psychological safety was not independently associated with turnover intention after adjustment for presenteeism, perceived busyness, and cumulative workplace harassment. This finding should be interpreted within the conceptual interrelationships of these variables. Psychological safety reflects the quality of interpersonal relationships within the team and the organizational climate in which nurses feel able to speak up, seek support, and address concerns [35]. Such conditions likely shape the experience and management of workplace stressors rather than directly determining decisions to leave. When more proximal and behaviorally anchored factors, such as health-related productivity loss and repeated exposure to harassment, are examined in the model, the direct association between psychological safety and turnover intention may be diminished. Consequently, psychological safety may function primarily as a contextual factor that buffers or mediates the impact of occupational stressors, rather than as a direct predictor of turnover intention. This interpretation underscores the significance of psychological safety as a component of healthy work environments, even if its effects on turnover intention are not directly observable [36].

The lower turnover retention among nurses living with a person requiring care likely reflects nurses' life stage and socioeconomic context. In Japan, cohabiting care recipients are most commonly elderly parents, suggesting that nurses who reported living with a care recipient are likely to be middle-aged or older [37]. At this stage of their careers, nurses often have established professional roles and responsibilities, as well as increased financial and familial obligations. In addition to the time and emotional demands of caregiving, the costs of long-term care may further increase the need for stable employment. In effect, [38]. These factors may constrain nurses' perceived ability to leave their current workplace, even in the presence of occupational stressors. Consequently, nurses living with a care recipient may report less frequent turnover intention not because their working conditions are more favorable, but because continued employment is economically imperative. This interpretation denotes that lower turnover intention frequency does not always signify better work environments, but may instead indicate restricted choices shaped by caregiving responsibilities and economic pressures.

This study has several limitations that should be acknowledged. First, information on the characteristics of participants' caregiving responsibilities was limited. Although participants were asked about living with a care recipient, details such as the relationship to the care recipient, intensity of caregiving demands, and duration of care were not assessed. Because caring for elderly parents is common in Japan, these unmeasured factors may have influenced the observed association between caregiving status and turnover intention. Second, this survey was conducted using a web-based questionnaire, which may have introduced selection bias. The use of an online survey may have potentially biased cohort selection in terms of digital literacy, health status, or interest in work-related issues. Third, economic factors, such as household income, caregiving-related

expenses, and financial strain, were not assessed. These variables may influence nurses' perceived feasibility of leaving their workplace and could partially explain the inverse association between turnover intention and living with living with persons requiring care observed in this study. Fourth, the cross-sectional design precludes causal inference, and cannot rule out selection bias since nurses who experienced greater difficulty balancing work and caregiving may have already left the workforce. Finally, all data were self-reported, which may have also introduced reporting bias. Despite these limitations, the study provides valuable insights into the graded nature of turnover intention and highlights the critical influence of caregiving responsibilities and life stage factors nurses' turnover intention.

The findings of this study have important implications for nursing management and health policy. First, turnover intention should be addressed as a graded and dynamic process rather than a binary outcome. Thus, early interventions targeting nurses who repeatedly consider leaving their workplace must be implemented. In this context, sickness presenteeism and perceived busyness may indicate declining work functioning and should be routinely monitored in organizational assessments. Second, the dose–response relationship observed between turnover intention and workplace harassment highlights the significance of comprehensive, organization-wide strategies that not only considers incident-based responses but also seeks to prevent repeated exposure through sustained leadership engagement and supportive workplace cultures. For such nurses, continued employment does not necessarily indicate favorable working conditions; thus, tailored support for middle-aged and older nurses balancing work and caregiving responsibilities must also be established. Policies that promote flexible work arrangements, caregiving support, and financial security may help sustain this segment of the nursing workforce and prevent less noticeable forms of occupational strain.

# Conclusion

This study demonstrates that nurses' turnover intention is a graded process rather than a binary outcome. Using an ordinal approach, sickness presenteeism, perceived busyness, and cumulative workplace harassment were identified as factors associated with more frequent consideration of leaving the workplace. These findings suggest that declining work functioning and repeated occupational stressors progressively intensify turnover intention, with sickness presenteeism and perceived busyness potentially serving as early warning indicators of future turnover. Although nurses living with a person requiring care reported less frequent turnover intention, this likely reflects constrained employment choices rather than more favorable working conditions. Addressing turnover intention as a graded phenomenon may facilitate earlier, targeted interventions to support nursing workforce retention.

# Declarations

7-1. Ethics approval and consent to participate

This study was approved by the Research Ethics Committee of Kawasaki City College of Nursing (Approval Number: 24-024 Approval Date: March 19, 2025) .Informed consent was obtained from all respondents.

7-2. Consent for publication

Not applicable.

7-3. Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

7-4. Competing interests

The authors declare that they have no competing interests.

7-5. Funding

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7.6 Authors' contributions

KY conceived and designed the study, performed the statistical analyses, and drafted the manuscript.

MA supervised the study, provided methodological guidance, and critically revised the manuscript.

SH contributed to data interpretation and manuscript revision.

All authors read and approved the final manuscript.

# References

1. World Health Organization. State of the world's nursing report 2025. In. Geneva: World Health Organization; 2025.
2. Cabinet Office GoJ. Annual Report on the Ageing Society [Summary] FY2024. In. Tokyo; 2024.
3. Takeda S. Factors Related to Turnover and Intention to Leave the Care Working Profession in Japan: A Review. Yonago Acta Med. 2023;66(2):196–201.
4. Ministry of Health LaW. Overview of the 2024 Health Administration Report (Employed Medical Personnel). In.; 2025.
5. Kaneda Y, Yamashiro A. Addressing nursing shortages in Japan: toward quality and quantity enhancement. J Public Health Emerg. 2023;7:35–35.
6. Chen Y, Zhou X, Bai X, Liu B, Chen F, Chang L, Liu H. A systematic review and meta-analysis of the effectiveness of social support on turnover intention in clinical nurses. Front Public Health. 2024;12:1393024.
7. Xie Z, Chen Z, Wang W, Pu J, Li G, Zhuang J, Fan X, Xiong Z, Chen H, Liang Y, et al. The effect of career compromise on nurses' turnover intention: the mediating role of job satisfaction. BMC Nurs. 2024;23(1):700.
8. Saigusa T, Yokomichi H, Miyamura T, Atashzadeh-Shoorideh F. Effects of Work-Family Conflict and Work Engagement Interactions on Hospital Nurses' Turnover Intentions during the COVID-19 Pandemic: A Cross-Sectional Study. Nurs Forum 2024, 2024(1).

9. Liu W, Zhao S, Shi L, Zhang Z, Liu X, Li L, Duan X, Li G, Lou F, Jia X, et al. Workplace violence, job satisfaction, burnout, perceived organisational support and their effects on turnover intention among Chinese nurses in tertiary hospitals: a cross-sectional study. BMJ Open. 2018;8(6):e019525.
10. Al Muharraq EH, Baker OG, Alallah SM. The Prevalence and The Relationship of Workplace Bullying and Nurses Turnover Intentions: A Cross Sectional Study. SAGE Open Nurs. 2022;8:23779608221074655.
11. Durmus A, Unal O, Turktemiz H, Ozturk YE. The effect of nurses' perceived workplace incivility on their presenteeism and turnover intention: The mediating role of work stress and psychological resilience. Int Nurs Rev. 2024;71(4):960–8.
12. Japanese Law Translation Database. [https://www.japaneselawtranslation.go.jp/]
13. Obata F. The Law to Prevent Power Harassment in Japan. Japan Labor Issues. 2021;5(28):23–36.
14. Kobayashi Y, Oe M, Ishida T, Matsuoka M, Chiba H, Uchimura N. Workplace Violence and Its Effects on Burnout and Secondary Traumatic Stress among Mental Healthcare Nurses in Japan. Int J Environ Res Public Health 2020, 17(8).
15. Luca CE, Sartorio A, Bonetti L, Bianchi M. Interventions for Preventing and Resolving Bullying in Nursing: A Scoping Review. Healthc (Basel) 2024, 12(2).
16. Somani R, Muntaner C, Hillan E, Velonis AJ, Smith P. A Systematic Review: Effectiveness of Interventions to De-escalate Workplace Violence against Nurses in Healthcare Settings. Saf Health Work. 2021;12(3):289–95.
17. Laschinger HKS, Leiter MP, Day A, Gilin Oore D, Mackinnon SP. Building empowering work environments that foster civility and organizational trust. Nurs Res. 2012;61(5):316–25.
18. Zhang J, Yang X, Zhang X, Liu Y, Liu M, Fang Y, Liu M, Wu M. Mediating effects of social support and presenteeism on turnover intention and post-traumatic stress disorder among Chinese nurses in the post-pandemic era: a cross-sectional study. Front Public Health. 2024;12:1323126.
19. Peter KA, Gerlach M, Kilcher G, Burgin R, Hahn S, Golz C. Extent and predictors of presenteeism among healthcare professionals working in Swiss hospitals, nursing homes and home care organizations. Sci Rep. 2023;13(1):12042.
20. Bertolini D, Marcatto F. Introducing the Ordinal Turnover Intention Scale (OTIS): A cross-sectional validation in Italian employees and foundation for longitudinal research. J Health Social Sci. 2025;10(1):42–55.
21. BowenXue, Feng Y, Zhao Y, Li X, Yang Y, Zhang J, Zhang Y, Hu Z, Luo H. Decent work, work engagement, and turnover intention among registered nurses: a cross-sectional study. BMC Nurs. 2024;23(1):31.
22. Arakida M, Mori K, Watanabe M, Furuhata E. Development of a Japanese version of a presenteeism scale. Kosei no Shihyo. 2016;63(13):6–12.
23. O'Donovan R, Van Dun D, McAuliffe E. Measuring psychological safety in healthcare teams: developing an observational measure to complement survey methods. BMC Med Res Methodol. 2020;20(1):203.
24. Sasaki N, Inoue A, Asaoka H, Sekiya Y, Nishi D, Tsutsumi A, Imamura K. The Survey Measure of Psychological Safety and Its Association with Mental Health and Job Performance: A Validation Study and Cross-Sectional Analysis. Int J Environ Res Public Health 2022, 19(16).
25. Niedhammer I, Pineau E, Bertrais S. Associations between work-related factors and sickness presenteeism: a prospective study using the national French working conditions survey. Occup Environ Med. 2024;81(9):448–55.

26. Gerlach M, Hahn S, Rossier C, Geese F, Hamers J, Backhaus R. Presenteeism among nurses: An integrative review. Int J Nurs Stud Adv. 2024;7:100261.
27. Fujino Y, Okawara M, Hino A, Muramatsu K, Nagata T, Tateishi S, Tsuji M, Ogami A, Ishimaru T. for the Cp: A prospective cohort study of presenteeism and increased risk of unemployment among Japanese workers during the COVID-19 pandemic. J Occup Health 2024, 66(1).
28. Seki EA, Ozluk B. Workload and intention to leave among nurses in Turkey: The mediating roles of organizational identification and work satisfaction. Int Nurs Rev. 2025;72(3):e13065.
29. van den Oetelaar W, Roelen CAM, Grolman W, Stellato RK, van Rhenen W. Exploring the relation between modelled and perceived workload of nurses and related job demands, job resources and personal resources; a longitudinal study. PLoS ONE. 2021;16(2):e0246658.
30. MacPhee M, Dahinten V, Havaei F. The Impact of Heavy Perceived Nurse Workloads on Patient and Nurse Outcomes. Administrative Sci 2017, 7(1).
31. Dapilah E, Druye AA. Investigating workplace bullying (WPB), intention to quit and depression among nurses in the Upper West Region of Ghana. PLoS ONE. 2024;19(11):e0305026.
32. Havaei F. Does the Type of Exposure to Workplace Violence Matter to Nurses' Mental Health? Healthc (Basel) 2021, 9(1).
33. Yeh TF, Chang YC, Feng WH, Sclerosis M, Yang CC. Effect of Workplace Violence on Turnover Intention: The Mediating Roles of Job Control, Psychological Demands, and Social Support. Inquiry. 2020;57:46958020969313.
34. Ota M, Lam L, Gilbert J, Hills D. Nurse leadership in promoting and supporting civility in health care settings: A scoping review. J Nurs Manag. 2022;30(8):4221–33.
35. Hebles M, Trincado-Munoz F, Ortega K. Stress and Turnover Intentions Within Healthcare Teams: The Mediating Role of Psychological Safety, and the Moderating Effect of COVID-19 Worry and Supervisor Support. Front Psychol. 2021;12:758438.
36. Sato T, Kakuda K, Sekiguchi E, Ishiseki M, Iwanami M, Akamatsu Y, Taito S. Psychological Safety and Burnout in Nurses: A Scoping Review. Cureus. 2025;17(9):e92411.
37. Ministry of Health LaW. Summary Report of Comprehensive Survey of Living Conditions 2022. In. Tokyo: Ministry of Health, Labour and Welfare; 2023.
38. Hu G, Wang Z, Zhang C, Xu J, Shen Z, Peng L, Xu H. Intergenerational differences in turnover intention of nurses: a cross-sectional survey in Jiangsu province, China. Front Psychiatry. 2025;16:1550623.

# Figures

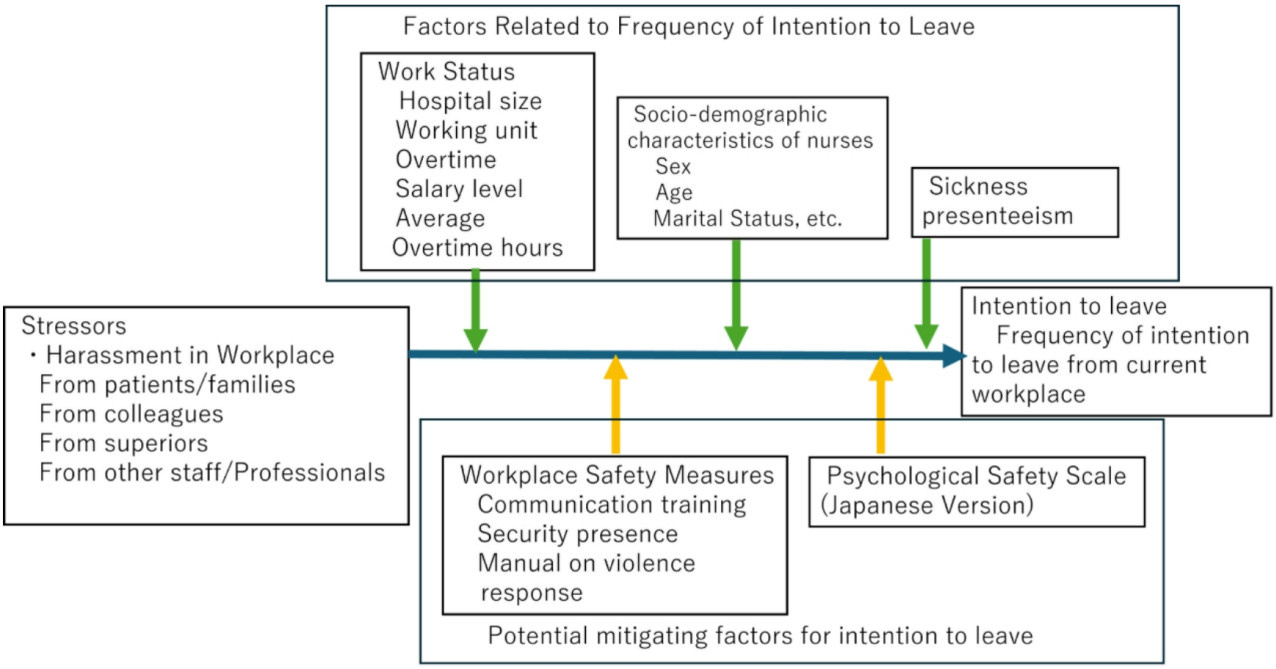



**Figure 1**

Conceptual framework of factors associated with turnover intention among hospital nurses in Japan