

## Supplementary Material

### External validation of the Saga Fall-related Injury Risk Model and exploration of common factors in multiple hospitals: A retrospective observational study

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## Supplementary Figures

Figure S1. Flowchart of Bedriddenness ranks.

Bold text indicates the classification labels used in the flowchart. These categories are based on the patient's physical independence and are defined as follows. Normal: Able to live independently without assistance. J: Generally independent, but with some restrictions. A: Able to live inside the home but has difficulty going outside. B: Mostly stays seated in a chair; mobility is significantly limited. C: Lives almost entirely in bed and requires assistance for daily activities.

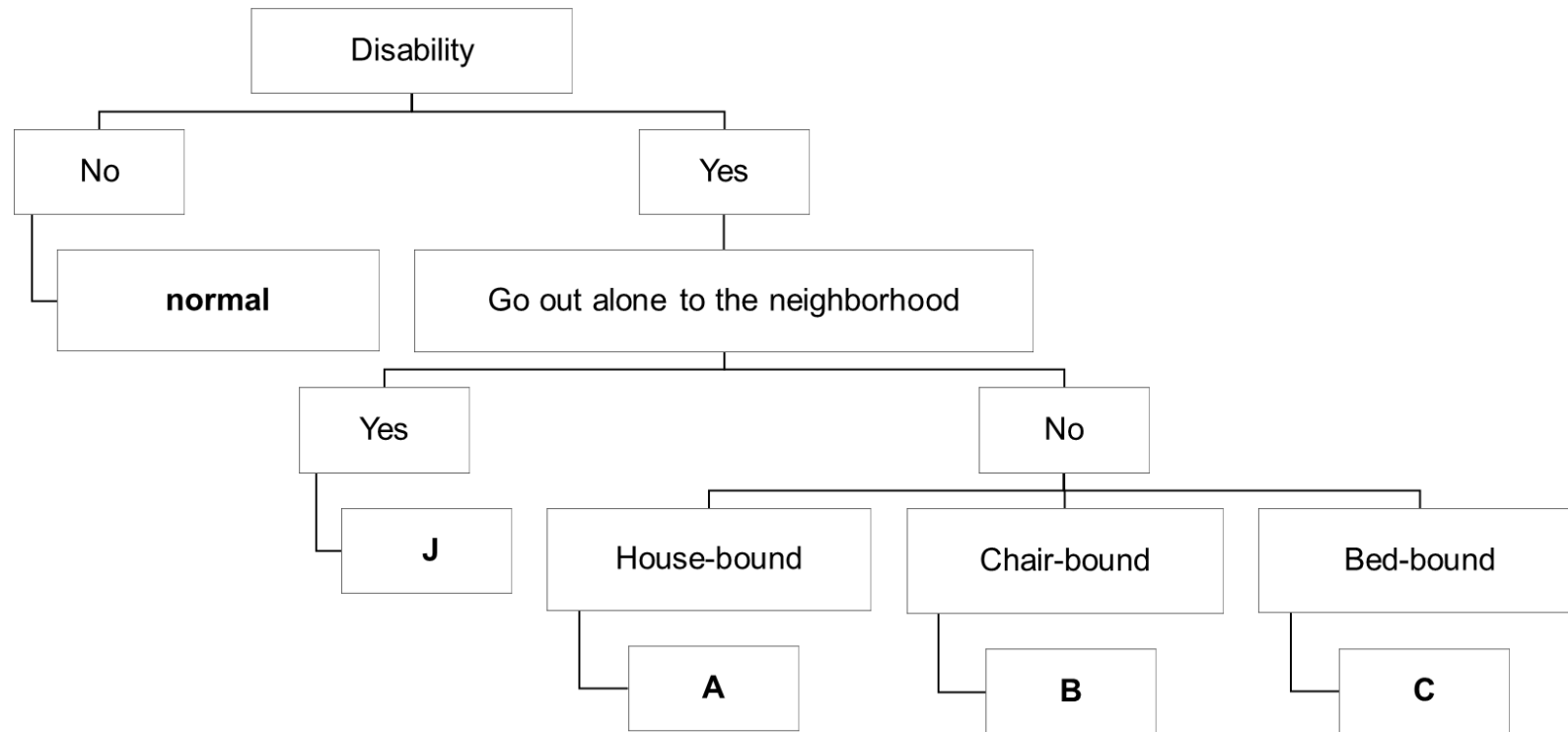
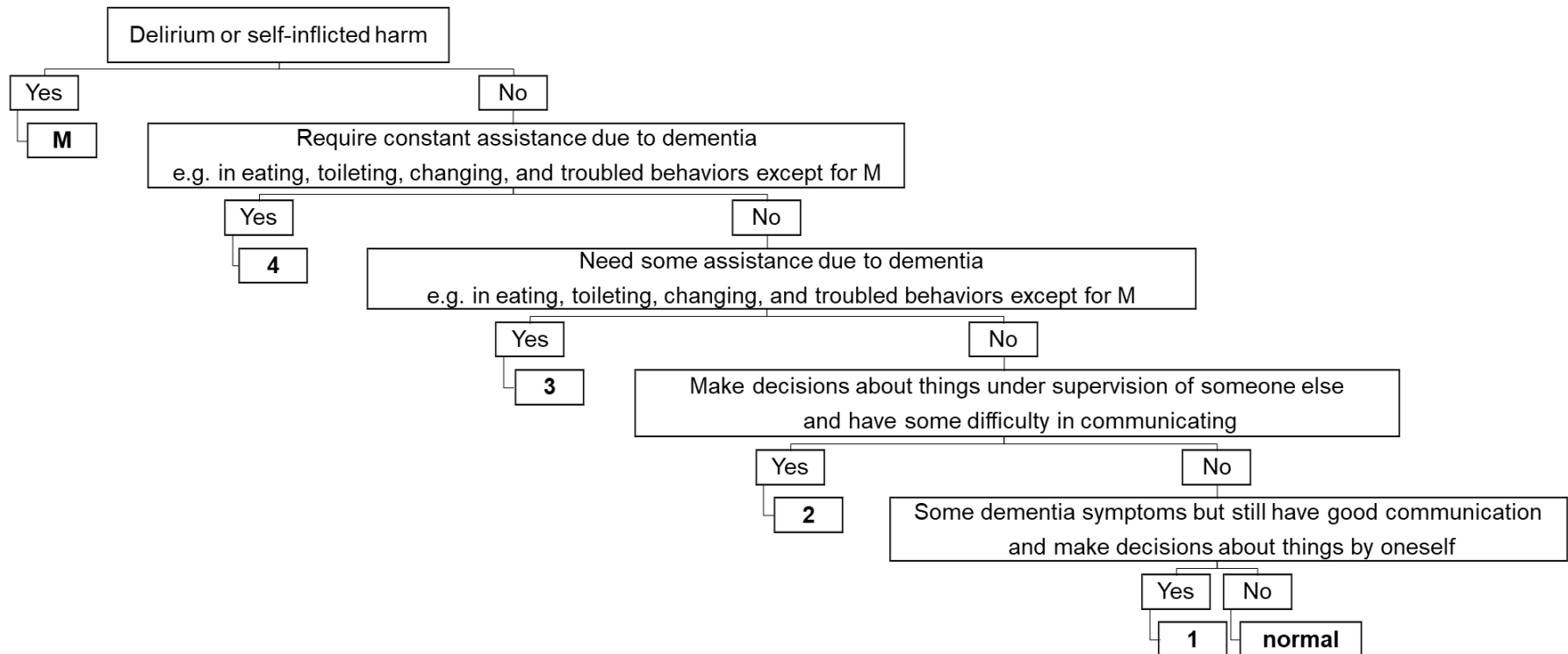


Figure S2. Flowchart of Cognitive function score.

Bold text and bold numerical values indicate the classification labels used in the flowchart. These categories are based on the patient's cognitive status and are defined as follows. Normal: No cognitive impairment. 1: Mild cognitive issues, but the patient remains independent. 2: Requires some attention in daily life. 3: Needs occasional assistance. 4: Requires constant caregiving. M: Needs professional medical treatment due to severe cognitive impairment.



## Supplementary Tables

Table S1. Background of each hospital.

	Location	Setting	Hospital beds (beds)	Long term care beds (beds)	Psychiatric beds (beds)	Tuberculo- sis beds (beds)	Number of departments	Annual emergency transports	Mean length of hospital stay (days)	Number of available patients	Fall rate (%)	With fall In- jury rate (%)
Hospital A	Saga city, Saga	tertiary	604	NA	24	NA	31	2471	11.9	28514	1.8	1.5 <sup>a</sup>
Hospital B	Shizuoka city, Shizuoka	tertiary	712	NA	NA	50	31	5094	11.2	41416	2.7	1.6 <sup>a</sup>
Hospital C	Ureshino city, Saga	tertiary	399	NA	NA	NA	24	2376	13	14362	3.3	1.1 <sup>a</sup>
Hospital D	Saga city, Saga	tertiary	450	NA	NA	NA	35	2764	10.4	30677	1.6	1.4 <sup>a</sup>
Hospital E	Kashima city, Saga	acute	111	NA	NA	NA	10	729	12.6	8370	3.1	2.4 <sup>a</sup>
Hospital F	Karatsu city, Saga	chronic	56	56	NA	NA	5	51	88.2	661	19.5	15.3 <sup>a</sup>
Hospital G	Isumi city, Chiba	chronic	144	48	4	NA	14	1700	17	395	0.5	0.3 <sup>a</sup>

Hospital H	Saga city, Saga	chronic	84	84	NA	NA	3	0	613	126	7.9	0.8 <sup>a</sup>
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NA: not applicable

This table was prepared by Tago M, Hirata R, Katsuki NE, et al. Validation and Improvement of the Saga Fall Risk Model: A Multicenter Retrospective Observational Study. *Clin Interv Aging*. 2024;19:175-188. Published 2024 Feb 7. Table S1 in doi:10.2147/CIA.S441235 was partially modified in the order of hospitals in this study.

<sup>a</sup> The data were calculated from the data collected in this study and added.

Table S2. All patients' backgrounds with or without fall and p value in univariate analysis.

Variable, Category (Reference)	All n=144777	With fall injury n=2247	Without fall injury <sup>a</sup> n=142530	p value <sup>b</sup>
Age, years	70 (58-79)	77 (69-85)	70 (58-79)	<0.001
Sex, Male (Female)	76742 (53)	1300 (58)	75442 (53)	<0.001
Department, Internal Medicine	67535 (47)	1217 (54)	66318 (47)	<0.001
Department, Neurosurgery	4878 (3)	124 (6)	4754 (3)	
Department, Others	72363 (50)	906 (40)	71457 (50)	
Department, Missing	1 (0)	0 (0)	1 (0)	
Type of admission, Planed	89657 (62)	991 (44)	88666 (62)	<0.001
Type of admission, Unplanned	53386 (37)	1246 (56)	52140 (37)	
Type of admission, Missing	1734 (1)	10 (0)	1724 (1)	
Emergency transport, Present	17759 (12)	429 (19)	17330 (12)	<0.001
Emergency transport, Absent	125501 (87)	1813 (81)	123688 (87)	
Emergency transport, Missing	1517 (1)	5 (0)	1512 (1)	
Medical referral letter, Present	79053 (55)	1215 (54)	77838 (55)	0.850
Medical referral letter, Absent	19850 (14)	308 (14)	19542 (14)	
Medical referral letter, Missing	45874 (32)	724 (32)	45150 (32)	
History of falls, Present (Absent)	10822 (8)	494 (22)	10328 (7)	<0.001

Hypnotics usage, Using	20549 (14)	509 (23)	20040 (14)	<0.001
Hypnotics usage, Not using	121697 (84)	1722 (77)	119975 (84)	
Hypnotics usage, Missing	2531 (2)	16 (1)	2515 (2)	
Antipsychotic drug usage, Using	9371 (7)	367 (16)	9004 (6)	<0.001
Antipsychotic drugs usage, Not using	132875 (92)	1864 (83)	131011 (92)	
Antipsychotic drugs usage, Missing	2531 (2)	16 (1)	2515 (2)	
Walking aids usage, Using	10681 (7)	458 (20)	10223 (7)	<0.001
Walking aids usage, Not using	41610 (29)	459 (20)	41151 (29)	
Walking aids usage, Missing	92486 (64)	1330 (59)	91156 (64)	
Disturbance of consciousness, Present	14425 (10)	490 (22)	13935 (10)	<0.001
Disturbance of consciousness, Absent	123981 (86)	1616 (72)	122365 (86)	
Disturbance of consciousness, Missing	6371 (4)	141 (6)	6230 (4)	
Visual impairment, Present	11079 (8)	236 (11)	10843 (8)	<0.001
Visual impairment, Absent	57035 (39)	845 (38)	56190 (39)	
Visual impairment, Missing	76663 (53)	1166 (52)	75497 (53)	
Ophthalmological disease <sup>c</sup> , Present	17621 (12)	316 (14)	17305 (12)	<0.001
Ophthalmological disease <sup>c</sup> , Absent	118722 (82)	1728 (77)	116994 (82)	
Ophthalmological disease <sup>c</sup> , Missing	8434 (6)	203 (9)	8231 (6)	
Parkinsonism, Present	1535 (1)	54 (2)	1481 (1)	<0.001

Parkinsonism, Absent	143220 (99)	2192 (98)	141028 (99)	
Parkinsonism, Missing	22 (0)	1 (0)	21 (0)	
Permanent damage by stroke, Present	11764 (8)	310 (14)	11454 (8)	<0.001
Permanent damage by stroke, Absent	132991 (92)	1936 (86)	131055 (92)	
Permanent damage by stroke, Missing	22 (0)	1 (0)	21 (0)	
Paraplegia and hemiplegia, Present	974 (1)	44 (2)	930 (1)	<0.001
Paraplegia and hemiplegia, Absent	143781 (99)	2202 (98)	141579 (99)	
Paraplegia and hemiplegia, Missing	22 (0)	1 (0)	21 (0)	
Alcoholism, Present	801 (1)	31 (1)	770 (1)	<0.001
Alcoholism, Absent	143954 (99)	2215 (99)	141739 (99)	
Alcoholism, Missing	22 (0)	1 (0)	21 (0)	
Diabetes mellitus, Present (Absent)	44099 (31)	860 (38)	43239 (30)	<0.001
Frequent urination, Present	23903 (17)	460 (21)	23443 (16)	<0.001
Frequent urination, Absent	61159 (42)	817 (36)	60342 (42)	
Frequent urination, Missing	59715 (41)	970 (43)	58745 (41)	
Eating, Independent	115269 (80)	1338 (60)	113931 (80)	<0.001
Eating, Requiring assistance	27593 (19)	882 (40)	26711 (19)	
Eating, Missing	1915 (1)	27 (1)	1888 (1)	
Grooming, Independent	95711 (66)	1073 (48)	94638 (66)	<0.001

Grooming, Requiring assistance	25647 (18)	885 (39)	24762 (17)	
Grooming, Missing	23419 (16)	289 (13)	23130 (16)	
Dressing, Independent	105763 (73)	996 (44)	104767 (74)	<0.001
Dressing, Requiring assistance	34615 (24)	1192 (53)	33423 (23)	
Dressing, Missing	4399 (3)	59 (3)	4340 (3)	
Swallowing, Independent	116732 (81)	1736 (77)	114996 (81)	<0.001
Swallowing, Requiring assistance	3770 (3)	241 (11)	3529 (3)	
Swallowing, Missing	24275 (17)	270 (12)	24005 (17)	
Toileting, Independent	91671 (63)	908 (40)	90763 (64)	<0.001
Toileting, Requiring assistance	48622 (34)	1278 (57)	47344 (33)	
Toileting, Missing	4484 (3)	61 (3)	4423 (3)	
Bladder control, Independent	116962 (81)	1333 (59)	115629 (81)	<0.001
Bladder control, Requiring assistance	22905 (16)	838 (37)	22067 (16)	
Bladder control, Missing	4910 (3)	76 (3)	4834 (3)	
Bowel control, Independent	115158 (80)	1267 (56)	113891 (80)	<0.001
Bowel control, Requiring assistance	24761 (17)	907 (40)	23854 (17)	
Bowel control, Missing	4858 (3)	73 (3)	4785 (3)	
Bathing, Independent	91521 (63)	908 (40)	90613 (64)	<0.001
Bathing, Requiring assistance	30550 (21)	1091 (49)	29459 (21)	

Bathing, Missing	22706 (16)	248 (11)	22458 (16)	
Taking prescription drugs, Independent	30675 (21)	402 (18)	30273 (21)	<0.001
Taking prescription drugs, Requiring assistance	6916 (5)	365 (16)	6551 (5)	
Taking prescription drugs, Missing	107186 (74)	1480 (66)	105706 (74)	
Transferring from wheelchair to bed, Independent	89207 (62)	884 (39)	88323 (62)	<0.001
Transferring from wheelchair to bed, Requiring assistance	51672 (36)	1313 (58)	50359 (35)	
Transferring from wheelchair to bed, Missing	3898 (3)	50 (2)	3848 (3)	
Mobility on level surfaces, Independent	89573 (62)	851 (38)	88722 (62)	<0.001
Mobility on level surfaces, Requiring assistance	50033 (35)	1317 (59)	48716 (34)	
Mobility on level surfaces, Missing	5171 (4)	79 (4)	5092 (4)	
Walking up and down stairs, Independent	88724 (61)	854 (38)	87888 (62)	<0.001
Walking up and down stairs, Requiring assistance	32901 (23)	1134 (51)	31767 (22)	
Walking up and down stairs, Missing	23134 (16)	259 (12)	22875 (16)	
Body Mass Index, <18.5	18539 (13)	504 (22)	18035 (13)	<0.001
Body Mass Index, $\geq 18.5$ and <25	84613 (58)	1266 (56)	83347 (59)	
Body Mass Index, $\geq 25$	38508 (27)	435 (19)	38073 (27)	
Body Mass Index, Missing	3117 (2)	42 (2)	3075 (2)	
Bedriddenness rank <sup>d</sup> , Normal	4913 (3)	34 (2)	4879 (3)	<0.001

Bedriddenness rank <sup>d</sup> , J	59317 (41)	445 (20)	58872 (41)	
Bedriddenness rank <sup>d</sup> , A	24412 (17)	579 (26)	23833 (17)	
Bedriddenness rank <sup>d</sup> , B	13094 (9)	479 (21)	12615 (9)	
Bedriddenness rank <sup>d</sup> , C	24276 (17)	551 (25)	23725 (17)	
Bedriddenness rank <sup>d</sup> , Missing	18765 (13)	159 (7)	18606 (13)	
Cognitive function score <sup>e</sup> , Normal	109516 (76)	1422 (63)	108094 (76)	<0.001
Cognitive function score <sup>e</sup> , 1	6507 (5)	214 (10)	6293 (4)	
Cognitive function score <sup>e</sup> , 2	3916 (3)	157 (7)	3759 (3)	
Cognitive function score <sup>e</sup> , 3	4606 (3)	259 (12)	4347 (3)	
Cognitive function score <sup>e</sup> , 4	1768 (1)	65 (3)	1703 (1)	
Cognitive function score <sup>e</sup> , M and Missing	18464 (13)	130 (6)	18334 (13)	
Rehabilitation, Implemented	37607 (26)	1396 (62)	36211 (25)	<0.001
Rehabilitation, Not implemented	107167 (74)	851 (38)	106316 (75)	
Rehabilitation, Missing	3 (0)	0 (0)	3 (0)	
Surgery, Implemented (Not implemented)	40251 (28)	510 (23)	39741 (28)	<0.001
Fall protection measures, Implemented	33651 (23)	598 (27)	33053 (23)	<0.001
Fall protection measures, Not implemented	8056 (6)	174 (8)	7882 (6)	
Fall protection measures, Missing	103070 (71)	1475 (66)	101595 (71)	
Length of stay, day	9 (4-16)	26 (15-46)	9 (4-16)	0.237

Continuous and categorical variables are presented as median (interquartile range) and frequency (percentage), respectively.

<sup>a</sup> The Without fall-related injury group includes patients who did not fall and patients who fell without injury.

<sup>b</sup> *P*-values were calculated by Mann-Whitney test for continuous variables and chi-squared test for categorical variables.

<sup>c</sup> Ophthalmologic diseases were defined as “yes” if the patient had glaucoma or cataract.

<sup>d</sup> Bedriddenness rank J means a statement of independence/autonomy, A means housebound, B means chair-bound, C means bed-bound.

<sup>e</sup> The cognitive levels are classified into 6 major categories (normal, 1: independence, 2: attention needed, 3: intermittent care needed, 4: continuous care needed, and M: specialized treatment needed).

Table S3. Multivariate analysis results for each hospital (all covariate factors).

Variable, Category (Reference)		hospital A	hospital B	hospital C	hospital D	hospital E	hospital F	hospital G	hospital H
		n=36221	n=45014	n=22424	n=31503	n=8429	n=661	n=399	n=125
Age,	OR	1.0 <sup>a</sup>	1.0 <sup>a</sup>	1.0 <sup>a</sup>	1.0 <sup>a</sup>	1.0	1.1 <sup>a</sup>	1.6	1.2
years	95%CI	1.0-1.0	1.0-1.0	1.0-1.0	1.0-1.0	1.0-1.0	1.0-1.2	0.0-318×10 <sup>298</sup>	0.0
Sex,	OR	1.0	1.4 <sup>a</sup>	1.0	1.3 <sup>a</sup>	1.6 <sup>a</sup>	4.0 <sup>a</sup>	0.0	40274
Male (Female)	95%CI	0.8-1.2	1.2-1.6	0.8-1.3	1.0-1.5	1.2-2.2	1.5-10.3	0.0	0.0
Department,	OR	0.8 <sup>a</sup>	1.0	0.9	1.0	1.6 <sup>a</sup>	2237×10 <sup>5</sup>	—	—
internal medicine (Others)	95%CI	0.7-1.0	0.8-1.1	0.7-1.2	0.8-1.2	1.1-2.3	0.0	—	—
Department,	OR	1.2	1.4	1.3	1.2	3.0 <sup>a</sup>	—	—	—
neurosurgery (Others)	95%CI	0.8-1.8	1.0-1.9	0.6-2.6	0.7-2.0	1.6-5.9	—	—	—
Department,	OR	—	—	—	—	—	—	8560×10 <sup>10 d</sup>	—
Missing (Others)	95%CI	—	—	—	—	—	—	0.0 <sup>d</sup>	—
Type of admission,	OR	1.3 <sup>a</sup>	1.7 <sup>a</sup>	1.3	1.2	1.2	2.4	0.0	0.1
Unplanned (Planned)	95%CI	1.0-1.7	1.4-2.0	1.0-1.9	0.9-1.7	0.9-1.6	0.9-6.6	0.0	0.0
Type of admission,	OR	0.0	2.2	—	—	0.0	—	—	—
Missing (Planned)	95%CI	0.0	0.9-5.4	—	—	0.0	—	—	—
Emergency transport,	OR	1.0	0.9	0.9	0.9	0.9	0.3	0.4	—

Present (Absent)	95%CI	0.7-1.4	0.7-1.1	0.7-1.3	0.2-3.9	0.6-1.3	0.0-1.9	0.0	—
Emergency transport,	OR	0.0	0.5	—	—	—	—	—	—
Missing (Absent)	95%CI	0.0	0.1-2.6	—	—	—	—	—	—
Referral medical letter,	OR	1.6 <sup>a</sup>	—	1.5 <sup>a</sup>	1.3	1.0	22.6 <sup>a</sup>	1782×10 <sup>3</sup>	38.5
Present (Absent)	95%CI	1.2-2.2	—	1.0-2.3	0.9-1.7	0.8-1.4	7.5-68.4	0.0	0.0
Referral medical letter,	OR	2378×10 <sup>10</sup>	—	—	—	—	—	—	—
Missing (Absent)	95%CI	0.0	—	—	—	—	—	—	—
History of falls,	OR	1.5 <sup>a</sup>	2.0 <sup>a</sup>	1.7 <sup>a</sup>	1.5 <sup>a</sup>	1.2	1.4	14347	0.0
Present (Absent)	95%CI	1.1-2.0	1.7-2.4	1.1-2.4	1.0-2.1	0.8-1.9	0.3-6.9	0.0	0.0
Hypnotic usage,	OR	0.8	1.4 <sup>a</sup>	1.6 <sup>a</sup>	1.3	1.3	1.7	0.1	33.0
Using (Not using)	95%CI	0.6-1.0	1.2-1.7	1.1-2.1	1.0-1.7	0.9-1.8	0.7-4.3	0.0	0.0
Hypnotic usage,	OR	—	—	—	—	0.4 <sup>a</sup>	—	—	—
Missing (Not using)	95%CI	—	—	—	—	0.2-0.7	—	—	—
Antipsychotic drugs usage,	OR	2.6 <sup>a</sup>	2.0 <sup>a</sup>	1.0	1.6 <sup>a</sup>	1.0	2.0	0.0	0.1
Using (Not using)	95%CI	1.9-3.4	1.6-2.5	0.7-1.6	1.2-2.0	0.7-1.5	0.7-5.6	0.0	0.0
Antipsychotic drugs usage,	OR	—	—	—	—	—	—	—	—
Missing (Not using)	95%CI	—	—	—	—	—	—	—	—
Disturbance of	OR	0.9	1.0	1.3	1.0	1.3	0.9	1.2	0.5

consciousness, Yes (No)	95%CI	0.7-1.3	0.8-1.3	0.8-2.3	0.7-1.5	0.9-1.9	0.4-2.2	0.0	0.0
Disturbance of conscious-	OR	2.2	0.9	—	1.4 <sup>a</sup>	0.3	—	—	—
ness, Missing (No)	95%CI	0.9-5.2	0.2-3.6	—	1.0-2.0	0.0	—	—	—
Visual impairment,	OR	0.9	—	1.5 <sup>a</sup>	—	0.8	63.4 <sup>a</sup>	11676.9	6.1
Present (Absence)	95%CI	0.8-1.2	—	1.1-2.1	—	0.6-1.1	7.0-579	0.0	0.0
Visual impairment,	OR	1.8	—	—	1.0 <sup>b</sup>	0.0	—	1227×10 <sup>12</sup>	1092×10 <sup>8</sup>
Missing (Absence)	95%CI	0.8-4.2	—	—	0.2-4.1 <sup>b</sup>	0.0	—	0.0	0.0
Ophthalmological disease <sup>b</sup> ,	OR	0.9	1.1	0.2 <sup>a</sup>	1.1	—	1.8	7696	171.1
Present (Absence)	95%CI	0.7-1.1	0.9-1.3	0.1-0.8	0.8-1.4	—	0.2-15.0	0.0	0.0
Ophthalmological disease <sup>b</sup> ,	OR	—	—	—	—	—	—	—	0.0
Missing (Absence)	95%CI	—	—	—	—	—	—	—	0.0
Parkinsonism,	OR	1.3	0.6	2.6 <sup>a</sup>	1.0	1.2	1.4	2404×10 <sup>3</sup>	—
Presence (Absence)	95%CI	0.8-2.3	0.3-1.2	1.3-5.5	0.5-1.9	0.5-3.1	0.2-10.7	0.0	—
Permanent damage by	OR	1.0	1.1	0.8	0.6	0.9	1.0	0.0	0.0
stroke, Present (Absence)	95%CI	0.7-1.3	0.9-1.4	0.5-1.4	0.4-0.9	0.6-1.2	0.3-2.7	0.0	0.0
Permanent damage by	OR	—	—	—	—	4.0	—	—	—
stroke, Missing (Absence)	95%CI	—	—	—	—	0.5-34.4	—	—	—
Paraplegia and hemiplegia,	OR	2.5 <sup>a</sup>	1.0	0.0	0.3	1.5	0.8	0.1	1.5

Present (Absence)	95%CI	1.5-4.3	0.3-3.4	0.0	0.1-1.2	0.4-6.8	0.3-2.3	0.0	0.0
Diabetes mellitus,	OR	1.5 <sup>a</sup>	1.2 <sup>a</sup>	1.0	1.3 <sup>a</sup>	1.2	8.7 <sup>a</sup>	0.0	0.0
Present (Absent)	95%CI	1.2-1.8	1.0-1.4	0.7-1.3	1.0-1.6	0.8-1.7	2.7-27.9	0.0	0.0
Frequent urination,	OR	0.9	1.1	1.2	—	—	89.1 <sup>a</sup>	0.0	9171×10 <sup>2</sup>
Present (Absent)	95%CI	0.7-1.0	0.9-1.3	0.8-2.0	—	—	28.5-279	0.0	0.0
Frequent urination,	OR	0.7	0.9	—	—	—	—	—	—
Missing (Absent)	95%CI	0.5-0.9	0.7-1.1	—	—	—	—	—	—
Eating, Requiring assistance	OR	1.5 <sup>a</sup>	1.7 <sup>a</sup>	1.3	1.0	1.2	0.6	0.0	11.3
(Independent)	95%CI	1.1-2.0	1.4-2.1	0.9-1.8	0.8-1.3	0.8-1.8	0.2-1.9	0.0	0.0
Eating, Missing category	OR	2.2	1.8 <sup>a</sup>	0.0	0.0	0.3	—	—	—
(Independent)	95%CI	0.7-7.2	1.1-2.9	0.0	0.0	0.0-2.5	—	—	—
Swallowing, Requiring as-	OR	2.0 <sup>a</sup>	1.1	—	1.9 <sup>a</sup>	1.7 <sup>a</sup>	3.2	6774×10 <sup>4</sup>	0.0
sistance (Independent)	95%CI	1.1-3.8	0.8-1.7	—	1.3-2.8	1.1-2.5	1.0-10.3	0.0	0.0
Swallowing, Missing	OR	1.0	0.0	—	—	2.7	—	—	—
(Independent)	95%CI	0.5-1.7	0.0	—	—	0.6-10.9	—	—	—
Body Mass Index,	OR	1.2	1.0	0.9	1.1	—	—	8560×10 <sup>10</sup>	0.4
≥18.5 and <25 (<18.5)	95%CI	0.9-1.5	0.8-1.2	0.6-1.3	0.8-1.6	—	—	0.0	0.0
Body Mass Index,	OR	1.0	1.0	1.2	1.1	—	—	—	0.9

$\geq 25$ (<18.5)	95%CI	0.7-1.4	0.8-1.2	0.8-1.8	0.8-1.7	—	—	—	0.0
Body Mass Index,	OR	1.3	0.0	0.7	1.3	—	—	—	—
Missing (<18.5)	95%CI	0.8-2.1	0.0	0.1-5.2	0.9-1.9	—	—	—	—
Bedriddenness rank,	OR	$1155 \times 10^4$ <sup>c</sup>	$8822 \times 10^3$ <sup>c</sup>	—	—	1.6	3.2	0.0	0.4
J (Normal)	95%CI	0.0	0.0	—	—	0.8-3.3	0.1-74.6	0.0	0.0
Bedriddenness rank,	OR	$2429 \times 10^4$ <sup>c</sup>	$1598 \times 10^4$ <sup>c</sup>	2.5 <sup>ad</sup>	2.5 <sup>ad</sup>	3.1 <sup>a</sup>	0.4	0.0	0.8
A (Normal)	95%CI	0.0	0.0	1.5-4.2 <sup>d</sup>	1.9-3.4 <sup>d</sup>	1.7-5.4	0.0-8.4	0.0	0.0
Bedriddenness rank,	OR	$3133 \times 10^4$ <sup>c</sup>	$1667 \times 10^4$ <sup>c</sup>	3.3 <sup>ad</sup>	2.3 <sup>ad</sup>	3.2 <sup>a</sup>	0.4	0.0	2847
B (Normal)	95%CI	0.0	0.0	2.0-5.5 <sup>d</sup>	1.6-3.2 <sup>d</sup>	1.7-5.8	0.0-6.1	0.0	0.0
Bedriddenness rank,	OR	$1646 \times 10^4$ <sup>c</sup>	$9887 \times 10^3$ <sup>c</sup>	2.4 <sup>ad</sup>	1.5 <sup>ad</sup>	1.3	0.7	0.0	$1425 \times 10^9$
C (Normal)	95%CI	0.0	0.0	1.4-4.0 <sup>d</sup>	1.0-2.1 <sup>d</sup>	0.7-2.7	0.0-12.8	0.0	0.0
Bedriddenness rank,	OR	$1105 \times 10^4$ <sup>c</sup>	$1087 \times 10^4$ <sup>c</sup>	1.5 <sup>d</sup>	1.1 <sup>d</sup>	8.2	—	0.0	—
Missing (Normal)	95%CI	0.0	0.0	0.9-2.4 <sup>d</sup>	0.5-2.2 <sup>d</sup>	0.0	—	0.0	—
Cognitive function score,	OR	1.4	1.2	1.2	1.0	1.8 <sup>a</sup>	2.0	0.2	0.0
1 (Normal)	95%CI	1.0-1.9	0.9-1.6	0.8-1.7	0.6-1.5	1.1-2.9	0.2-16.3	0.0	0.0
Cognitive function score,	OR	1.3	0.9	0.9	2.2 <sup>a</sup>	1.2	0.5	0.0	0.0
2 (Normal)	95%CI	0.8-2.1	0.6-1.3	0.6-1.5	1.4-3.4	0.7-2.1	0.1-3.7	0.0	0.0
Cognitive function score,	OR	1.7	1.2	0.9	2.1 <sup>a</sup>	1.4	0.5	$1431 \times 10^2$	$4180 \times 10^3$

3 (Normal)	95%CI	1.0-2.9	0.8-1.8	0.5-1.6	1.5-2.8	0.8-2.5	0.1-3.3	0.0	0.0
Cognitive function score,	OR	0.8	0.5	0.2	2.2 <sup>a</sup>	1.3	0.2	33.6	0.2
4 (Normal)	95%CI	0.3-2.3	0.2-1.1	0.6-1.0	1.4-3.6	0.5-3.6	0.0-1.4	0.0	0.0
Cognitive function score,	OR	2.0	0.4	0.0	0.9	0.0	0.2	5266×10 <sup>8</sup>	28.3
M and Missing category (Normal)	95%CI	0.6-6.5	0.2-0.9	0.0	0.7-1.2	0.0	0.0-3.9	0.0	0.0

OR, odds ratio; CI, confidence interval. The factors used in the multivariate logistic regression were all assessable at admission and had low collinearity with each other.

<sup>a</sup> Representative OR of  $p < 0.05$

<sup>b</sup> Presence was used as the criterion for analysis because there were no participants in the no visual impairment category.

<sup>c</sup> The categories as a whole, but not significantly different in the category constructs

<sup>d</sup> Data from hospitals with no bedriddenness ranks were analyzed using J or J1 as the criterion