Development of a Job Stressor Scale for Nurses Caring for Patients with Intractable Neurological Diseases

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ABSTRACT

The purpose of this research is to verify the reliability and validity of a job stressor scale for nurses caring for patients with intractable neurological diseases. A mail survey was conducted using a self-report questionnaire. The subjects were 263 nurses and assistant nurses working in wards specializing in intractable neurological diseases. The response rate was 71.9% (valid response rate, 66.2%).

With regard to reliability, internal consistency and stability were assessed. Internal consistency was examined via Cronbach's α. For stability, the test-retest method was performed and stability was examined via intraclass correlation coefficients. With regard to validity, factor validity, criterion-related validity, and content validity were assessed. Exploratory factor analysis was used for factor validity. For criterion-related validity, an existing scale was used as an external criterion; concurrent validity was examined via Spearman's rank correlation coefficients.

As a result of analysis, there were 26 items in the scale created with an eight factor structure. Cronbach's α for the 26 items was 0.90; with the exception of two factors, α for all of the individual sub-factors was high at 0.7 or higher. The intraclass correlation coefficient for the 26 items was 0.89 (p < 0.001). With regard to criterion-related validity, concurrent validity was confirmed and the correlation coefficient with an external criterion was 0.73 (p < 0.001). For content validity, subjects who responded that "The questionnaire represents a stressor well or to a degree" accounted for 81% of the total responses.

Reliability and validity were confirmed, so the scale created in the current research is a usable scale.

Key words: *Nurse, Stressor, Scale, Intractable neurological diseases*

Many studies report that the stress of nurses is significant[11,18]. It is necessary to reduce nurses' stress immediately, as stress leads to a decrease in the quality of the care provided and to rapid nurse turnover[12,17].

Intractable neurological diseases, for example, amyotrophic lateral sclerosis, multiple sclerosis, and Parkinson's disease, involve muscles and nerves as the primary focus. It has been reported that the physical and mental burdens for caregivers and patients are significant, because these diseases are clinically characterized by uncertainty of cause, no known cure, a long course, and progressive symptoms of motor impairment[2,7,10]. The work of nurses caring for patients with intractable neurological diseases is stressful. The experiences that are causes of stress (stressors) for nurses must be accurately determined to create a

workplace that involves minimal stress. A scale is needed to measure these stressors.

Previously developed and widely-used stressor scales for nurses were primarily scales applicable to nurses in every department (hereafter denoted as general nurses' stressor scales)[5,6,9]. It is clear that nurses' stressors are different when care is focused on a limited area by department[4,16]. The results of literature reviews indicate the difficulty in ascertaining stressors accurately in specific departments by means of general nurses' stressor scales. Nurses' stressor scales for psychiatry[19], pediatric oncology[8] and nursing homes[3] have been developed. A stressor scale for nurses caring for patients with intractable neurological diseases has yet to be developed.

The purpose of this research is to verify the reliability and validity of a job stressor scale for nurses

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caring for patients with intractable neurological diseases (hereafter denoted as Job Stressor Scale).

METHODS

Process of creation of the draft scale

Items in the draft scale were collected using a self-administered, anonymous questionnaire given to 284 nurses working in the Neuromuscular Ward, and from interviews with five nurses who consented to participate. The questionnaire was in the form of free responses to questions like "Describe the saddest/most painful/most frustrating/most unpleasant event you have experienced at work." A semi-structured interview was used. As a result of inductive analysis, a draft scale consisting of 69 items was created[1]. Item analysis, face validity and internal consistency were performed in a pretest. Consequently, 42 items were eliminated, because they did not fit the Job Stressor Scale for nurses caring for patients with intractable neurological diseases.

The current study used a draft scale consisting of 27 items. For each question, the participants answered using a Likert scale from 1 (never) to 5 (always).

Subjects and procedures

The subjects were 263 nurses and assistant nurses working in the neurological and neuromuscular wards at ten hospitals. These hospitals had 300 or more beds, and were designated as either "a base hospital" or "a cooperation hospital" for the treatment of patients with intractable diseases. From hospitals meeting the study's requirements, 13 were randomly selected, and a request for study participation was sent to the director of nursing at each hospital. Ten hospitals consented to participate in the study.

The study was conducted by a self-administered questionnaire sent by mail, with a draft scale consisting of 27 items (Appendix). The study period was from January to February 2006.

Instruments

The Nursing Stress Scale (NSS)[9] was used for the examination of validity in the current study. NSS consists of 35-items and was developed for use with nurses in all departments. The reliability and validity were verified. Responses range from 1 to 4: 1 = Not at all, 2 = A little, 3 = A moderate amount, 4 = Very much. The NSS total score is calculated by adding the scores for all 35 items and a higher score denotes higher stress.

Statistical analysis

With regard to reliability, internal consistency and stability were assessed. Internal consistency was examined via Cronbach's α. For stability, the test-retest method was performed and stability was examined via intraclass correlation coefficients.

With regard to validity, factor validity, criterion-related validity, and content validity were assessed. Exploratory factor analysis was used for factor validity. Factor analysis by the principal factor method, promax rotation, was performed with an eigenvalue >1 for the 27 items in a draft scale. Promax rotation was selected as the factors were not expected to be completely independent of each other. For criterion-related validity, an existing scale, NSS, a general nurses' stressor scale with verified reliability and validity, was used as an external criterion. Criterion-related validity was examined via Spearman's rank correlation coefficients.

To measure content validity, the question "Do you think the question items in this survey represent the stress experienced by nurses caring for patients with intractable neurological diseases?" was included in the questionnaire. Subjects were asked to answer on a scale of 4: (A) They represent it well; (B) They represent it to a degree; (C) They represent it very little, and (D) They do not represent it.

Ethical considerations

Contents of the research, the importance of voluntary cooperation, and protection of privacy were explained in writing to the subjects. Consent to the research was determined to have been obtained upon collection of the questionnaire. This research was reviewed and approved by the ethics committee of Hiroshima University's Graduate School of Health Science (Department of Nursing Science).

RESULTS

Questionnaires were distributed to 263 individuals, and 189 questionnaires were collected (response rate: 71.9%). Responses with missing data for even 1 question item in the scale were excluded, so there were 174 valid responses (valid response rate: 66.2%). The interval for the test-retest method was about a week.

Demographic characteristics

Subject attributes are shown in Table 1. The mean age was 35.6 ± 10.0 years of age (mean ± SD), the average years of clinical experience was 13.2 ± 9.3 years, and the average years of experience nursing patients with intractable neurological diseases was 3.6 ± 2.9 years.

Validity

Factor validity

Exploratory factor analysis by the principal factor method and promax rotation were performed for the 27 items in the scale, and eight factors were extracted. Item number 22 belonging to fac-

Table 1. Subject attributes

		N	(%)
Attribute			n = 174
Sex	Male	15	8.6
	Female	159	91.4
Age	24 and under	28	16.1
	25 to 29	34	19.5
	30 to 39	49	28.2
	40 and over	63	36.2
Marital status	Single	75	43.1
	Married	85	48.9
	Widowed·Divorced	13	7.5
	Unanswered	1	0.6
Employment qualifications	Assistant nurse	12	6.9
	Nurse	160	92.0
	Other	2	1.2
Highest educational level received	High school nursing program	26	14.9
	Vocational school	133	76.4
	Junior college	7	4.0
	University	1	0.6
	Other	6	3.4
	Unanswered	1	0.6
Years of clinical experience	2 and under	25	14.4
	3 to 5	28	16.1
	6 to 10	30	17.2
	11 or more	91	52.3
Years of experience nursing patients with neuromuscular diseases	2 and under	89	51.1
	3 to 5	56	32.2
	6 to 10	23	13.2
	11 or more	6	3.4
Staffing system	3 shifts	152	87.4
	2 shifts	20	11.5
	No night shifts	2	1.1
Position	Assistant Head Nurse	9	5.2
	Staff member	162	93.1
	Unanswered	3	1.7
Requested assignment	Yes	51	29.3
	No	122	70.1
	Unanswered	1	0.6

tor 1 was eliminated, as there was difficulty in interpretation. Factor analysis was performed again and eight factors were extracted from among the 26 items (Table 2). Inter-factor correlations among the factors were statistically significant (r = 0.19-0.51, p < 0.05) (Table 3). Examination of reliability and validity was conducted in 26 items (hereafter denoted as Original Scale).

Factor 1 was termed "Conflict with doctors". Factor 2 consisted of items representing difficulty of involvement with the patient and his/her family and was termed "Difficulty of involvement". Factor 3 was termed "Quantitative workload". Factor 4 was termed "Conflict with superiors". Factor 5 was termed "Conflict with colleagues". Factor 6 consisted of items representing a lack of outcomes commensurate with the effort expended providing

Table 2. Factor structure for the stressor scale for nurses caring for patients with neuromuscular diseases

Question items	Factors extracted								Cronbach's α	Mean	SD
	1	2	3	4	5	6	7	8			
Factor 1: Conflict with doctors											
24 Unable to accept the doctor's response to the patient	0.82	0.02	-0.04	-0.03	-0.04	0.04	-0.05	0.09	0.84	2.81	0.86
5 Slow response by doctors	0.79	0.03	0.05	-0.09	0.15	-0.12	0.03	-0.01			
21 Unable to accept the doctor's policies and thinking	0.75	0.00	0.06	0.08	-0.10	0.02	-0.03	0.05			
11 Poor communication with doctors	0.58	0.03	-0.14	0.07	0.09	0.15	0.01	-0.09			
Factor 2: Difficulty of involvement											
1 Feel burdened by caring for uncommunicative patients	0.02	0.81	-0.09	-0.12	-0.05	-0.04	0.01	0.11	0.81	3.66	0.79
20 Feel burdened with caring for patients with a number of specific demands	0.08	0.71	-0.05	0.12	-0.11	-0.03	-0.04	0.14			
25 Feel burdened by caring for distempered and hard-to-please patients	-0.14	0.60	0.10	0.10	-0.06	0.13	0.04	0.10			
3 Feel unable to satisfy the patient no matter what I try	0.07	0.55	-0.01	-0.03	-0.01	0.10	0.23	-0.18			
13 Unable to adequately respond to the fears and wishes of the patient and his or her family	-0.02	0.39	0.22	-0.04	0.12	0.33	-0.10	-0.23			
Factor 3: Quantitative workload											
8 Pained by not being able to take enough time to provide care the patient can accept	0.03	-0.06	0.86	-0.06	0.03	-0.01	0.06	-0.07	0.84	3.91	0.85
14 Pained by not being able to take enough time to closely relate and talk to patients	-0.14	-0.18	0.80	0.08	-0.09	0.24	0.04	-0.10			
27 Unable to manage my work because we are short-staffed	-0.02	0.10	0.73	0.01	0.13	-0.11	-0.16	0.16			
6 Feel burdened by so much work that I can't meet the patient's needs	0.15	0.23	0.60	-0.05	-0.04	-0.11	0.16	0.03			
Factor 4: Conflict with superiors											
19 Feel that my superior does not understand my feelings	0.04	-0.16	0.03	0.93	-0.01	0.05	0.06	0.01	0.81	2.46	0.93
26 Feel that my superior does not trust me	-0.09	0.04	-0.03	0.74	-0.01	0.03	-0.03	0.09			
2 Disagree with my superior's thinking	0.16	0.25	-0.02	0.59	0.10	-0.17	-0.05	-0.16			
Factor 5: Conflict with colleagues											
7 Work with uncooperative staff	-0.04	-0.07	0.02	0.00	0.89	-0.08	0.16	0.01	0.78	2.45	0.95
15 There are nurses I do not want to work with	0.04	-0.02	0.09	0.04	0.77	-0.02	-0.21	0.10			
9 Have a difference of opinions with colleagues regarding care	0.15	-0.16	-0.13	0.00	0.50	0.22	0.12	-0.03			
Factor 6: Imbalance between care and outcome											
10 Frustrated that the patient's condition is unchanged or has worsened despite desperately providing care	0.04	0.10	-0.03	0.04	-0.05	0.66	0.06	0.02	0.66	3.00	0.76
23 Unsure how to respond to complaints from the patient and his or her family	-0.18	0.23	-0.06	-0.04	0.14	0.65	-0.11	0.24			
16 Frustrated with the patient's advancing condition despite desperately providing care	0.23	-0.21	0.18	-0.03	-0.12	0.49	-0.03	0.13			
Factor 7: Verbal abuse											
4 Ordered about by the patient	0.07	0.10	-0.01	-0.08	0.01	0.00	0.75	0.07	0.79	2.92	1.12
12 Talked to abusively by patients	-0.13	0.02	0.06	0.10	0.04	-0.07	0.74	0.29			
Factor 8: Uncertainties regarding the prospects of care											
18 Have dim prospects for care	0.25	0.00	0.01	0.02	0.01	0.32	0.05	0.56	0.63	2.37	0.93
17 Care refused by the patient (including a request for another nurse)	-0.08	0.15	-0.04	0.00	0.06	0.06	0.22	0.54			

principal factor method,   promax rotation

Table 3. Inter-factor Correlations of the Job Stressor Scale for Nurses Caring for Patients with Intractable Neurological Diseases

n = 174

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Factor 1: Conflict with doctors	1.00	—	—	—	—	—	—	—
Factor 2: Difficulty of involvement	0.29**	1.00	—	—	—	—	—	—
Factor 3: Quantitative workload	0.28**	0.48**	1.00	—	—	—	—	—
Factor 4: Conflict with superiors	0.44**	0.37**	0.19*	1.00	—	—	—	—
Factor 5: Conflict with colleagues	0.46**	0.16*	0.30**	0.42**	1.00	—	—	—
Factor 6: Imbalance between care and outcome	0.30**	0.44**	0.38**	0.30**	0.21**	1.00	—	—
Factor 7: Verbal abuse	0.23**	0.51**	0.34**	0.29**	0.19*	0.38**	1.00	—
Factor 8: Uncertainties regarding the prospects of care	0.27**	0.40**	0.34**	0.31**	0.24**	0.45**	0.45**	1.00

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

care and was termed "Imbalance between care and outcome". Factor 7 consisted of items where the nurse suffered verbal abuse by the patient and was termed "Verbal abuse". Factor 8 consisted of items representing unclear prospects regarding the prospects of care or patients, and was termed "Uncertainties regarding the prospects of care".

Criterion-related validity

For criterion-related validity, an existing scale was used as an external criterion; while concurrent validity was examined via Spearman's rank correlation coefficients. The Spearman's rank correlation coefficient between original scale and external criteria (NSS) was 0.73 ($p < 0.001$).

Content validity

The question "Do you think the question items in this survey represent the stress experienced by nurses caring for patients with intractable neurological diseases?" was placed in the questionnaire for content validity. The responses to the items were as follows: 44 subjects responded "A) They represent it well" (25.3%); 97 responded "B) They represent it to a degree" (55.7%); 10 responded "C) They represent it very little" (5.7%), 3 responded "D) They do not represent it"(1.7%), and 20 subjects left the question unanswered (11.5%).

Reliability
Internal consistency

Internal consistency was confirmed via Cronbach's α. For the 26 items as a whole, α = 0.90. Cronbach's α of each factor was more than 0.7, except for factor 6 and factor 8 (Table 2).
Stability

Stability was examined via the test-retest method. The mean interval for the test-retest method was 7.72 ± 4.80 days.

With regard to stability between the first and second surveys, the intra-class correlation coefficient was calculated. The result was an intra-class correlation coefficient of 0.89 ($p < 0.001$).

DISCUSSION

Characteristics of the subject population

The mean age of the subject population was 35.6 ± 10.0 years of age (mean ± SD), and the average years of clinical experience was 13.2 ± 9.3 years. Nurses with 11 or more years of experience accounted for 52% of the subjects. In contrast, their average years of experience nursing patients with intractable neurological diseases was 3.6 ± 2.9 years. Nurses with 2 or fewer years of experience accounted for 51% of the subjects, while those with 11 or more years accounted for 3%.

Characteristics of the subject population in the current research indicated that although many had vast experience of 10 or more years as nurses, they had little experience nursing patients with intractable neurological diseases.

Validity of the original scale

For factor analysis, promax rotation was appropriate as the inter-factor correlations among the factors were statistically significant. The original scale had an eight factor structure: "conflict with doctors"; "difficulty of involvement"; "quantitative workload"; "conflict with superiors"; "conflict with colleagues"; "imbalance between care and outcome"; "verbal abuse", and "uncertainties regarding the prospects for care".

In previous studies targeting the general nursing profession[5,6,9], for example, in the study by Higasiguchi et al, seven stressors were extracted: "conflict with other nursing staff"; "nursing role conflict"; "conflict with physicians and autonomy"; "death and dying"; "qualitative workload"; "quantitative workload" and "conflict with patients". Our results were comparable with those of Higashiguchi. The factors of "conflict with doctors", "quantitative workload", "conflict with superiors", and "conflict with colleagues" were consistent with the three stressors identified in the study conducted by Higashiguchi: "conflict with other nursing staff",

"conflict with physicians and autonomy" and "quantitative workload." These stressors may arise for nurses in any field, regardless of their department. However, "difficulty of involvement", "imbalance between care and outcome", "verbal abuse" and "uncertainties regarding the prospects for care" were not extracted in Higashiguchi's study.

Patients with intractable neurological diseases require accurate care for various needs. As the disease progresses, the care level for activities of daily life is high. In the case of progressive speech impairment, nurses need specific skills for communication. When nurses attended to patients with intractable neurological diseases, "Difficulty of involvement" was a stressor for nurses.

"Imbalance between care and outcome" is a stressor related to a lack of outcome commensurate with the effort expended providing care. Siegrist[13] stated, with respect to the amount of effort at work, that when compensation for that work is lacking, an even greater stress response (effort-reward imbalance model) is created. Despite nurses desperately providing care, symptoms of intractable neurological diseases inevitably progress and the environment around the patient also worsens. This may become a stressor for nurses.

As the realities of life are harsh, the patient may display various psychological responses and become aggressive; this is most readily directed at the nurses closest to the patient. In such circumstances, nurses think of comments by patients as "Verbal abuse".

The characteristics that make MS useful as a model of chronic illness--its uncertainty and unpredictability and its progressive and disabling qualities--make it difficult for patients and their families to predict its course and plan their lives[14]. It is often equally difficult for health care providers to identify appropriate medical and nursing interventions, given the unpredictable course that the disease may take[14]. "Uncertainties regarding the prospects of care" in the current research may be the nurse's own trouble with providing care because the patient's prospects for the future are uncertain.

Therefore, these four factors may be stressors resulting from the characteristics of neurological and neuromuscular diseases such as their progressive nature, intractability and lack of a cure. These are important stressors of nurses caring for patients with intractable neurological diseases. However, it is possible that these stressors may arise for nurses in any field, regardless of their department. Additional research is necessary to investigate whether or not these four factors are job stressors specific to nurses caring for patients with intractable neurological diseases.

Criterion-related validity, correlation with the original scale and the NSS scale as an external criterion, was 0.73 (p < 0.001).

A strong correlation between the original scale and general nurses' stressor scales was indicated. For the original scale, criterion-related validity was confirmed.

For content validity, subjects responding "They represent it well" or "They represent it to a degree" accounted for 81% of the responses overall. 80 percent of nurses responded that "the original scale in this survey represents the stress experienced by nurses caring for patients with intractable neurological diseases". For the original scale, content validity was confirmed.

Thus, the scale created is one that retained its validity because content validity and criterion-related validity were noted.

Reliability of the original scale

Internal consistency was confirmed via Cronbach's α, and α for the items as a whole was 0.90. With the exception of Factors 6 and 8, the α for all of the factors was high at 0.7 or greater. Cronbach's α should be above 0.7. The internal consistency of the original scale was confirmed. Streiner & Norman[15] stated, "The first problem is that α is dependent not only on the magnitude of the correlations among the items, but also on the number of items in the scale". The low Cronbach's α of factors 6 and 8 was dependent on the number of items in these factors.

With regard to stability, the intraclass correlation coefficient for the total score between the first and second surveys was calculated. The result was an intraclass correlation coefficient of 0.89. Because the intraclass correlation coefficient was 0.7 or higher, the stability of the original scale was confirmed.

Reliability and validity were confirmed, so the scale created in the current research is a usable scale.

Study limitations

The facilities had 300 or more beds, and were hospitals where intractable diseases were treated or hospitals that cooperated in the treatment of intractable diseases. Thus, there are limits in applying the scale to all nurses caring for patients with intractable neurological diseases. In recent years, patients with intractable neurological diseases tend to be transferred home, so the scale's applicability must be expanded in the future to include, for instance, stressors for nurses caring for patients with intractable neurological diseases at home.

As a result of analysis, there were two items for 2 of 8 factors. Those factors had a rather low Cronbach's α, an indicator of internal consistency,

so further refinement of the scale is needed in the future.

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(Appendix) Questionnaire

		always	usually	sometimes	rarely	never
1	Feel burdened by caring for uncommunicative patients	5	4	3	2	1
2	Disagree with my superior's thinking	5	4	3	2	1
3	Feel unable to satisfy the patient no matter what I try	5	4	3	2	1
4	Ordered about by the patient	5	4	3	2	1
5	Slow response by doctors	5	4	3	2	1
6	Feel burdened by so much work that I can't meet the patient's needs	5	4	3	2	1
7	Work with uncooperative staff	5	4	3	2	1
8	Pained by not being able to take enough time to provide care the patient can accept	5	4	3	2	1
9	Have a difference of opinions with colleagues regarding care	5	4	3	2	1
10	Frustrated that the patient's condition is unchanged or has worsened despite desperately providing care	5	4	3	2	1
11	Poor communication with doctors	5	4	3	2	1
12	Talked to abusively by patients	5	4	3	2	1
13	Unable to adequately respond to the fears and wishes of the patient and his or her family	5	4	3	2	1
14	Pained by not being able to take enough time to closely relate and talk to patients	5	4	3	2	1
15	There are nurses I do not want to work with	5	4	3	2	1
16	Frustrated with the patient's advancing condition despite desperately providing care	5	4	3	2	1
17	Care refused by the patient (including a request for another nurse)	5	4	3	2	1
18	Have dim prospects for care	5	4	3	2	1
19	Feel that my superior does not understand my feelings	5	4	3	2	1
20	Feel burdened with caring for patients with a number of specific demands	5	4	3	2	1
21	Unable to accept the doctor's policies and thinking	5	4	3	2	1
22	Slow response by superiors	5	4	3	2	1
23	Unsure how to respond to complaints from the patient and his or her family	5	4	3	2	1
24	Unable to accept the doctor's response to the patient	5	4	3	2	1
25	Feel burdened by caring for distempered and hard-to-please patients	5	4	3	2	1
26	Feel that my superior does not trust me	5	4	3	2	1
27	Unable to manage my work because we are short-staffed	5	4	3	2	1

*As a result of analys ;Item number 22 belonging to factor 1 was eliminated, as there was difficulty in interpretation.