

**Figure 1.** Classification based on cognition function, assessed using the Mini-Mental State Examination (MMSE) and the Barthel Index (BI).

### Interviews

Interviews of the patients and their families were conducted. Patients were asked about behaviors, emotional aspects and difficulties concerning spatial neglect and related symptoms. Families were asked the same questions. Interviews were recorded and then transcribed. Before an interview, an attending physician or a ward nurse introduced the researcher and explained the purpose. After obtaining consent to participate in the study, the researcher again explained the study purpose and ascertained the patient's desire to participate. Interviews were conducted and recorded in the ward or the dining room, with maximum effort put into ensuring patients' privacy.

### Observations

The behaviors of the patients in their daily hospital life activities were observed to describe daily physical function. Information was collected about the characteristics of the patient's daily physical function and cognition. To ensure accuracy of the observations, the contents of observations were discussed with a ward nurse, the patient, the family and physicians.

### Methods of analysis

The first study purpose was to examine the overlap between cognitive and physical function, addressed using a scattergram. The second study purpose, to describe qualities related to cognitive-physical function, was addressed by interview and observational data to describe the findings in the scattergram.

Scattergrams of the patients with respect to MMSE and BI scores were plotted to capture the relationship of cognition with physical function. For the MMSE, the cut-off score was set at 24 points, which indicates a normal cognitive state (Brackhus *et al.*, 1992; Tombaugh & McIntyre, 1992; Derik & Wade, 1993). For the BI, the cut-off score was 60 points, which indicates independence with self-care and independence with indoor living (Wade & Collin, 1988; Geert *et al.*, 1999; Pamela *et al.*, 2000). Classification of each patient into one of the cognition-physical function quadrants occurred using these criteria (Fig. 1).

Analysis of interview and observation data enabled a description of cognitive and physical function characteristics for patients in each scattergram quadrant to be made. Basic content analysis procedures (Waltz *et al.*, 1991) were used to summarize interview data and observational data were systematically integrated to enhance understanding.

## RESULTS

Patients' backgrounds are summarized in Table 2. When the MMSE and BI scores were used to construct a scattergram with previously described cut-off values, the following four groups were obtained. Three patients with a MMSE score  $\geq 24$  and a BI score  $> 60$  had relatively high cognitive abilities and physical function (Fig. 1: upper right quadrant, Group 1). Four patients with a MMSE score  $\geq 24$  and a BI score  $\leq 60$  had high cognitive ability, although physical function was low (Fig. 1: lower right quadrant, Group 2). Five patients with a MMSE score  $< 24$  and a BI score  $\leq 60$

**Table 2.** Summary of patient characteristics (n = 12)

Age (years)	72 ± 7.0 (range: 64–84)
Sex (male : female)	9 : 3
Diagnosis	
Infarction	9
Hemorrhage	3
Hemiparesis: Brunnstrom stage (left)	
I to III	8
IV to V	4
Duration from onset (months)	2.8 ± 2.0 (range: 1–8)
Type of higher cerebral dysfunction	
Left spatial neglect	11
Attention disorder	9
Anosognosia	7
Left asomatognosia	1
Cognitive ability (MMSE score)	22.7 ± 6.6 (range: 12–29)
Physical ability (BI score)	46.7 ± 20.0 (range: 15–90)

BI, Barthel Index, MMSE, Mini Mental State Examination.

were low both in cognitive ability and physical function (Fig. 1: lower left quadrant, Group 3). No patients had low cognitive ability with high physical function (Fig. 1: upper left quadrant).

When common items were extracted from characteristics of behaviors and cognition, the five patients in Group 3 were further divided into two groups (Group 3a and 3b).

**Characteristics of each group**

Characteristics of each group of patients are shown in Table 3. Group 1 was characterized by preserved cognitive ability; mild to moderate hemiplegia with high physical ability; and manifestation of spatial neglect, attention disorder and anosognosia. These patients had left spatial neglect and bumping on the left side sometimes occurred. When bumping on the left side occurred, these patients were aware and capable of behavioral adjustment, such as changing the direction of the wheelchair. Although conversation was smooth, the patients could abruptly become vague in the middle of a conversation, show restlessness, or act on a hasty judgment. Sometimes irrelevant behaviors could be seen. The patients accepted the calls to pay attention to the left side and assistance from nurses and families, and did not feel stressed about their care.

In these patients, assistance for hemiplegia and assistance to improve independent mobility were provided. In response to the call to pay attention, these patients

**Table 3.** Summary of patients classified in groups

Group	MMSE	BI	Sex	Age	Diagnosis	Time after onset (months)	Paralysis (Brunnstrom stage)	Neglect	Attention disorder	Anosognosia	Left-right agnosia	Left asomatognosia	Memory disorder
Group 1	29	90	M	70	Infarction	1	IV-II-IV	No	Yes	No	No	No	No
	29	65	M	73	Hemorrhage	1	IV-IV-IV	Yes	No	Yes	No	No	No
	26	70	M	78	Infarction	2	IV-IV-IV	Yes	Yes	No	No	No	No
Group 2	29	60	M	64	Hemorrhage	1	V-V-IV	Yes	No	Yes	Yes	No	No
	29	40	M	67	Infarction	3	III-III-III	Yes	No	No	No	No	No
	27	35	M	65	Infarction	8	I-I-I	Yes	Yes	No	No	No	No
Group 3a	26	30	M	67	Infarction	2	I-I-III	Yes	Yes	Yes	No	Yes	No
	17	40	M	72	Infarction	4	I-I-II	Yes	Yes	No	No	No	No
	17	40	M	66	Hemorrhage	1	I-I-III	Yes	Yes	No	No	No	Yes
Group 3b	16	40	F	84	Infarction	3	I-I-II	Yes	Yes	Yes	No	Yes	Yes
	15	15	F	83	Infarction	4	II-II-II	Yes	Yes	Yes	No	Yes	Yes
	12	35	F	78	Infarction	3	I-I-I	Yes	Yes	Yes	No	Yes	Yes

Paralysis was all left-sided.

managed to direct attention toward the left side. However, when they were called to pay attention, they occasionally exhibited irrelevant behaviors in the context of situations.

Group 2 was characterized by preserved cognitive ability; severe hemiplegia with low physical ability; and signs of spatial neglect, attention disorder, anosognosia, left-right agnosia and asomatognosia. Patients in this group made many mistakes in handling the wheelchair and could not master the manipulation. Each action was markedly clumsy. When moving, the body faltered towards the left side, resulting in loss of balance and bumping towards the left side. Even when bumping on the left occurred, they were unaware of what had happened and could not manage behavioral adjustment. If these patients were engaged in continuous activity and were called by someone else, they became confused, showed a perplexed expression of 'not knowing what to do', brooded over the situation and stopped what they were doing. The more they were told what to do, the more confused they became, and finally they discontinued their activities and had difficulty starting again. The patients showed strong discomfort with their basic care, did not give sufficient attention to their spatial neglect and frequently bumped into barriers. These patients thought that all their problems would be solved if they could walk.

In Group 2 patients, assistance to improve independence of mobility and guidance to improve spatial neglect (calling attention) were provided. However, the patients were strongly displeased with this care, and care providers were not able to achieve their necessary guidance role. For these patients, the method of calling out to them and the timing needed to be considered. Observations regarding the patients' recognition of their own disability and the way they respond were considered necessary.

Group 3a was characterized by low cognitive abilities; severe hemiplegia and low physical ability; and signs of spatial neglect, attention disorder, anosognosia, asomatognosia and memory disturbance. In this group, actions were crude and marked inattention was obvious. The balance of sitting posture was poor; the body tilted towards the left, tumbled down and remained in the fallen position. They paid almost no attention to the paralyzed side. Even when the paralyzed side was pinned under the trunk, these patients were totally unaware. 'Younger brother's hand is heavy' or 'The hemiplegia is only slight, there is no problem at all', some commented, denying their own hemiplegia and disability. Furthermore, they spoke in a loud voice regardless of the situation and engaged in one-way talk about the same subject. These patients

had difficulty understanding why the people around were speaking to them.

In these patients, due to poor body balance and lack of concentration on actions, assistance was provided in recognition of the hazard imposed by the symptoms. The patients' low cognitive abilities in addition to neglect and related symptoms created a hazardous situation, demanding nursing care which protected them from harm.

Group 3b was characterized by low cognitive ability; severe hemiplegia and low physical ability; and signs of neglect, attention disorder, anosognosia, asomatognosia and memory disorders. These patients fell asleep when there was nothing to do. Almost no physical movement could be observed. 'I am all right. The illness is only mild. I shall be going home soon', one said. Patients in this group were provided with generalized basic care and assistance that gave stimulation. Even though these patients had both low physical and cognitive abilities, conversation and care intervention with consideration of spatial neglect and related symptoms was required.

## DISCUSSION

In the present study, using cognitive-physical functional evaluations by MMSE and BI, together with subjective and objective data presumably related to higher cerebral dysfunction, the characteristics of patients with higher cerebral dysfunction were examined and classified into several groups.

In our patients, the mean interval from disease onset was  $2.8 \pm 2.0$  months, which is considered the phase of onset of higher cerebral dysfunction in the clinical course of patients with stroke (Gainotti, 1972; Bisiach *et al.*, 1990; Pedersen *et al.*, 1997). 'Neglect' was observed in 11 out of 12 patients. This 'neglect' has been demonstrated by prior studies to have unfavorable effects on functional prognosis (Hier *et al.*, 1983a; Hier *et al.*, 1983b; Gialanell & Mottioli, 1992; Audrey *et al.*, 1999; Jehkonen *et al.*, 2000).

Based on cognitive-physical functional evaluations and data related to higher cerebral dysfunction, patients were broadly classified into three groups: Group 1 with preserved cognitive and physical functions; Group 2 with preserved cognitive function and lowered physical function and; Group 3 with lowered cognitive and physical function. This classification was consistent with the classification based on the standard values of the widely used evaluation tools MMSE and BI, and there were characteristic inter-group differences in the data related to higher cerebral dysfunction.

Group 2 had low physical function and neglect was observed. Usually, these patients are assisted or guided

by calling attention according to individual actions. However, these patients were aware that they were not satisfactorily acquiring appropriate actions and exhibited unpleasantness or irritation. There is often a gap between their own disability in performing actions and acceptance of this fact, and a gap in perceiving care providers' affectionate assistance and communication. This gap in perception is speculated to pose difficulties in keeping pace with the next situation during a continuous movement or action.

Although 'neglect' has been understood as a disorder of 'spatial perception', the difficulties observed in this group may imply an inability to perceive spatio-temporal changes during the continuity of a series of actions. Previous studies have suggested subgroups of neglect disorders that may be consistent with the findings in this group (Jehkonen *et al.*, 2000; Adair *et al.*, 1995).

Anosognosia and asomatognosia were observed in Group 2. These symptoms occur with high frequency during the acute phase of stroke and usually become unremarkable later (Ay *et al.*, 1999). However, anosognosia and asomatognosia have been reported to be associated with unfavorable acceptance of disability and to be a determinant of the prognosis of rehabilitation (Robertson *et al.*, 1998; Jehkonen *et al.*, 2000). It is possible that patients in this group showed unpleasantness because of the gap between the recognition of disease or disability and the inability to understand the reality and context of a situation (Robertson *et al.*, 1998). Hence, there was an inappropriate perception of assistance provided by caregivers.

In the conventional approach of nursing care, 'care by calling attention' is the major strategy for neglect. However, with patients showing characteristics of Group 2, because these patients do not recognize the need for care and deviate from 'others' in perceiving affection, 'care by calling attention' may promote discomfort or the experience of failure in these patients. Therefore, nursing care should take various considerations into account such as observing where attention is directed, avoiding confusion caused by excessive attention calling or guidance, appropriate timing, waiting for behavioral adjustment, telling the patient if adjustment is successful, and conveying a sense of success to the patient.

Group 1 had preserved cognitive and physical functions. Even though neglect was present, the patients were aware of it and were capable of adjusting their actions. They responded to the care of attention calling and were able to direct their attention to the left side. For these patients, conventional nursing care of drawing attention to the left side for the purpose of improving 'neglect' was effective. However, the patients often

became confused during a conversation or operation, found it difficult to follow the context of a situation continuously (as seen in Group 2) and exhibited irrelevant actions out of their own interpretation. In these circumstances, potentiality of attention disorders should be considered and it is necessary to observe whether behaviors deviate from the context of the surrounding.

In Group 3, both physical and cognitive functions were low. In Group 3a, there were strong effects of higher cerebral dysfunction. Lowered attention was remarkable and actions were rough and incomplete. Communication with others tended to be one-sided and there was impairment in mutual understanding. Because the patient finds it difficult to direct attention to the impaired extremities and space (Gialanell & Mottioli, 1992), self-care of the left side of the body is neglected. As these patients cannot control the direction of attention, different methods should be designed to stimulate the right side to which attention can be directed and to stimulate the left side which is neglected. In line with this, the living environment should be adjusted.

Group 3b had lowered cognitive and physical functions, as seen in Group 3a. The biggest difference between these two groups was a fluctuating and markedly low level of consciousness in Group 3b. This is probably a result of cerebral arteriosclerosis and fluctuating cerebral blood flow. There were few spontaneous complaints, and conversation and movements were not initiated without stimulation. In the daily life setting, higher cerebral dysfunction such as neglect is hidden beneath the extensively lowered cerebral function. In this group of patients, care plans to provide function-promoting programs, including activities, entertainment and hobbies may be needed.

Among our patients, none were in the fourth quadrant (MMSE score < 24, BI score > 60). This may be because generally, stroke patients lose both cognitive and physical function. In some left brain-damaged stroke patients, pure aphasia, which complicates low cognitive function and high physical performances, is observed. This may not be the case in right brain-damaged patients. Scores of MMSE depend on verbal function, while there is no well-established method to evaluate right brain function. Alternatively, this may be due to agnosia and apraxia. Patients with Alzheimer's dementia often complicate agnosia and apraxia, and show high physical performance but low cognitive ability.

In the present study, right brain-damaged stroke patients were classified into several groups using cognitive-physical function evaluations together with subjective and objective data associated with higher

cerebral dysfunction. 'Neglect', the common disorder among these patients, and its related symptoms have been regarded as a disorder of spatial perception. However, the characteristics observed in Group 2 suggest that 'neglect' may have another facet, manifesting as disorders in perceiving continuous spatio-temporal changes of an action and comprehending the context of a situation. In these patients, although 'care by calling attention' is the conventional approach, more appropriate care should be provided based on an assessment of cognitive-physical function and spatio-temporal recognition of individual patients.

There are two subgroups in the third quadrant, suggesting the need for new classification tools other than cognitive-physical function. Observations and evaluations considering these aspects are essential and form the basis of care.

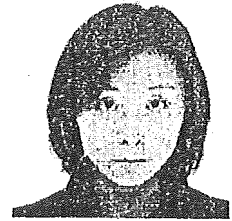
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# 失認関連症候を有する右大脳半球脳卒中患者の生活障害の経時的変化



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## 要 約

目的：失認関連症候(以下, NRD)を有する右大脳半球損傷(以下, RBD)脳卒中患者の急性期から慢性期における生活障害の特徴を明らかにすることを目的とした。

方法：Y市内地域中核病院, 都内高齢者専門病院に平成14年4月6日～10月31日に入院した, ①初回発症, ②RBD, ③NRDあり, の3基準を満たし, 同意が得られた脳卒中患者全例を対象に, 入院時, 退院時, 退院後1カ月, 3カ月, 6カ月に面接と行動観察を行った。入院時のNational Institutes of Health Stroke Scale(NIHSS)総得点により対象者を3群, すなわち, 軽度, 中度, 重度に分類し, 各群の生活障害の特性を時系列別に検討した。

結果：初回脳卒中患者は42名, うち14名がRBD脳卒中患者だった。このうちさらにNRDを有した者は11名, 同意が得られた9名(梗塞7名, 出血2名; 男6名, 女3名; 平均年齢 $66.2 \pm 3.4$ 歳)を対象とした。半側空間無視8名, 身体失識1名, 着衣失行1名で, うち1名はNeglectと半側身体失認を有していた。NIHSSは平均 $11.3 \pm 2.9$ 点で, 軽度2, 中度4, 重度3名と分類された。2名は, NRDが入院後早期に消失し生活障害がみられなかった。7名には, 入院時から退院後6カ月後にもNRDと生活障害が認められた。

結論：NRDを有するRBD脳卒中患者の発生頻度の高さと, NRDによる生活障害の重要性を示した。脳卒中重症度分類による時系列変化の特徴から, 発症後早期に軽度な患者は, 早期にNRDが消失し生活障害がないこと, 発症後早期に中度と重度の患者には, 入院時から退院後6カ月までもNRDと生活障害が残ることを明らかにした。

Key words：失認関連症候, 右大脳半球損傷脳卒中患者, 生活障害, 時系列変化

## 緒 言

脳卒中患者の発症後早期から生じる失認・失行について, 急性期から慢性期における自然経過はいまだに不明であり, その評価は非常に難しい<sup>1)</sup>。失認の中でも半側空間無視(以下, Neglect)は, 視空間認知障害, 半側不注意を特徴とし, しばしば病態失認, 病態無関心, 眼球麻痺など様々な関連症候(neglect and related disorders, 以下NRD)を伴う<sup>2,3)</sup>。また, その発生頻度は, 右大脳半球損傷(right brain-damaged, 以下RBD)脳卒中患者に極めて高い<sup>4)</sup>。

脳卒中患者のNeglectに関する先行研究では, 患者の日常生活動作能力(以下, ADL)とNeglectに強い関連性がある<sup>5,6)</sup>ことが示されており, それは負の影響要因<sup>7,8)</sup>とされている。さらに, RBD脳卒中患者の機能障害への負の関連要因<sup>9)</sup>であり, セルフケアへの影響要因としては,

運動障害よりも重要<sup>10,11)</sup>とされている。

このようにNeglectの障害の重要性が示されているにもかかわらず, Neglectによる生活障害の自然経過は明らかにされておらず, 患者の具体的なケア方法に関する知見はいまだに得られていない。看護師がNRDを有する患者の生活面に焦点を当て, 看護ケアの提供方法を確立していくことは, 患者や家族の生活を支援する上で急務であり, 意義があると考ええる。

そこで本研究は, NRDを有するRBD脳卒中患者の急性期から慢性期における生活への支障を明らかにすることを目的とした。

## 方 法

### 1. 対 象

平成14年4月6日～10月31日にY市内地域中核病院, 都内高齢者専門病院に入院した全脳卒中患者のうち, ①初回発症, ②RBD, ③NRDあり, の3基準を満たし, 同意が得られた者を研究の対象とした。

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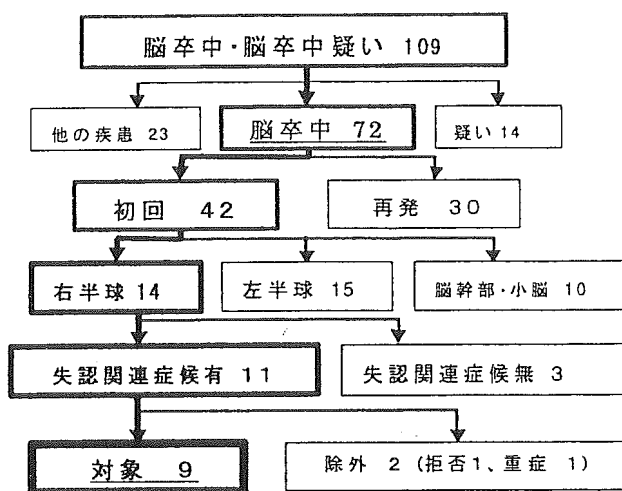


図1 対象者の選定過程

脳卒中患者全体72名中11名(15.3%)、初回発症右大脳半球損傷患者14名中11名(78.6%)の発症頻度。

## 2. 調査方法：前向き追跡調査

入院時、退院時、退院後1カ月、退院後3カ月、退院後6カ月(以下T0, T1, T2, T3, T4)の5時点での調査を実施した。T0, T1は調査病棟で、T2, T3, T4は転院先の病院あるいは自宅へ訪問し、調査した。

## 3. 調査項目

1) 脳卒中重症度の評価には、National Institutes of Health Stroke Scale<sup>12)</sup> (以下、NIHSS)を用いた。これは、意識、視野、眼球運動、運動、感覚、言語、注意障害の11項目からなる神経学的障害の評価尺度であり<sup>13,14)</sup>、信頼性、妥当性が高いとされる。得点範囲は0~42点で、得点が高いほど重症度が重い。急性期から発症後3カ月までの神経学的障害を評価するのに有用とされている。

### 2) 属性、ADL、NRDの種類

属性は、年齢、性別、疾患名、部位、合併症の有無、NRDの種類である。ADLの評価にはBarthel Index<sup>15)</sup> (以下、BI)を用いた。この得点範囲は0~100点で、得点が高いほどADLが高いことを示す。NRDの有無とその種類については、神経内科専門医の診断によった。

3) Neglect行動の評価にはCatherine Bergego Scale<sup>16)</sup> (以下、CBS)を用いた。これは、Neglectによる行動の評価とモニタリングを目的とし、直接観察法により患者の日常生活行動10項目(整容、着衣、食事、歯磨き、注視の方向、左上下肢の認識、聴覚性注意、移動・ぶつかる、空間見当識、身の回りのものを探す)の評価尺度であり、信頼性、妥当性が検証されている。得点範囲は0~30点で、得点が高いほどNeglect行動が高いことを示す。

4) さらに、自己の障害の認識について面接を行った。

表1 T0の対象者の属性(n=9)

年齢(歳)		66.2 ± 3.4 (49 to 80)
性別	男/女	6/3
脳卒中の種類	梗塞	7
	出血	2
NRDの種類	半側空間無視	8
	着衣失行	1
	身体失識	1
脳卒中重症度	NIHSS <sup>1)</sup> (Score)	11.3 ± 2.9 (1 to 26)
ADL	BI <sup>2)</sup> (Score)	21.6 ± 5.5 (5 to 55)
Neglect行動	CBS <sup>3)</sup> (Score)	14.5 ± 7.2 (1 to 24)

1) NIHSS: National Institutes of Health Stroke Scale(0~42 score) 2) BI: Barthel Index(0~100 score) 3) CBS: Catherine Bergego Scale(0~30 score) Mean ± SD(range)

## 4. 分析方法

T0のNIHSS総得点により対象者を3群、すなわち、軽度(0~5)、中度(6~13)、重度(14以上)<sup>17,18)</sup>に分類し、重症度別にCBS得点による生活障害の特性と面接で得られた情報を基に、NRDによる生活障害を時系列に記述し、比較検討した。

## 5. 倫理的配慮

調査病院における院内倫理審査委員会の承認を受けた。担当医と研究者が、本研究の目的、方法、プライバシーの保護、拒否の権利について説明し、同意書に署名を得た上で実施した。

## 結 果

### 1. NRDを有するRBD脳卒中患者の割合(図1)

調査病院に入院した脳卒中および脳卒中疑いの全患者は109名、脳卒中と診断された患者は72名、うち基準を満たした患者は11名(15.3%)であった。初回発症RBD脳卒中患者14名の中で、11名(78.6%)がNRDを有していた。このうち、重篤な呼吸障害があった者、家族が拒否した者各1名を除外し、同意が得られた9名(81.8%)を本研究の対象とした。

### 2. 対象の属性および概要(表1, 2)

対象の概要は表1に示す。T0のNIHSS得点を用いた3群の分類は表2に示す。全対象が右利きだった。発症から入院までの期間は平均1.2 ± 0.4(範囲0~2)日だった。

### 3. 重症度別Neglect行動の経時的変化(図2)

#### 1) 軽度者(図3)

##### a) Neglect行動

NRDが入院後すぐに消失し、5時点ともに生活障害がなかった。

##### b) 健康障害への認識

5時点ともに認識できていた。

表2 3群の特徴(T0-NIHSSによる脳卒中重症度)

NIHSSによる重症度分類 対象 No	軽度		中度				重度		
	1	2	3	4	5	6	7	8	9
NIHSS	1	2	6	8	12	13	16	21	26
BI	25	35	55	15	20	20	15	5	5
CBS	2	1	23	12	19	12	21	24	17
年齢(歳)	72	65	80	69	62	75	49	55	69
性別	男	男	男	女	女	男	女	男	男
脳卒中の種類	梗塞	梗塞	梗塞	梗塞	梗塞	出血	出血	梗塞	梗塞
NRD <sup>1)</sup> の種類	DA	Neg	Neg	Neg	Neg	Neg	Neg	Neg	Neg
合併症	NO	NO	NO	NO	NO	NO	NO	NO	NO

NIHSS, BI, CBS : score, 1) DA : 着衣失行, Neg : 半側空間無視, AH : 身体失識

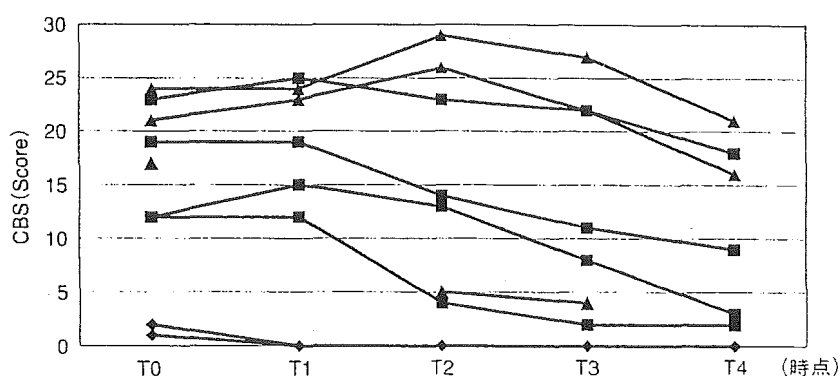


図2 CBSによる全対象の経時的変化

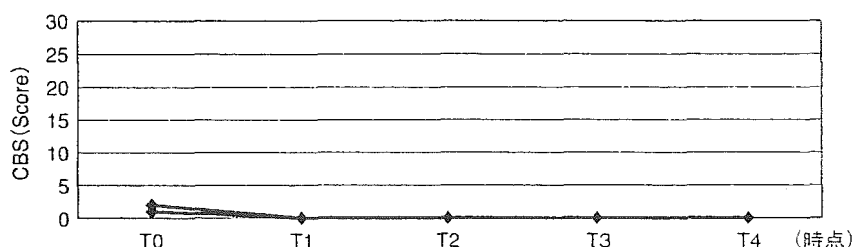


図3 軽度者の経時的変化

2) 中度者(図4)

a) Neglect行動

T0からT4まで、右手動作にもNeglect行動による生活障害があった。特にT2, T3では、生活行動拡大とともに移動動作にNeglect行動があったが、CBS得点はT3, T4で改善がみられた。うち2名はT2で、背後からの声かけや刺激にきょろきょろして振り返れなかった。また3名は、T0からT3で左側からの声かけにきょろきょろと辺りを見回す行動がみられた。

b) 健康障害への認識

4名中2名はT0で「どこも悪くない」と、麻痺や障害の認識は全くなかったが、T2では麻痺や生活障害に気づき

がみられるようになった。残り2名は、5時点ともに障害への認識はあった。特にT2からT4では、Neglectを自分なりに認識し、「なだめなだめやる」と、自宅生活について疲労や恐怖感を訴えていた。

3) 重度者(図5)

1名は退院時には脳ヘルニアを起こしていた。

a) Neglect行動

T0からT4まで、右手動作にもNeglect行動があった。T3, T4では、生活行動の拡大とともにCBS得点が高くなった。また3名は、T0からT3まで左側からの声かけに視線が合わず、追視が不安定で、動作中にきょろきょろと辺りを見回しては動作への集中が途切れていた。



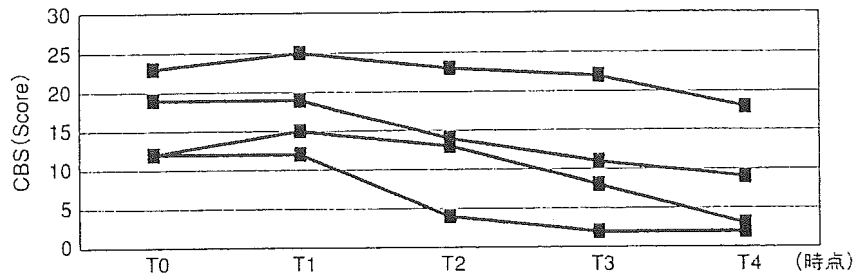


図4 中度者の経時的変化

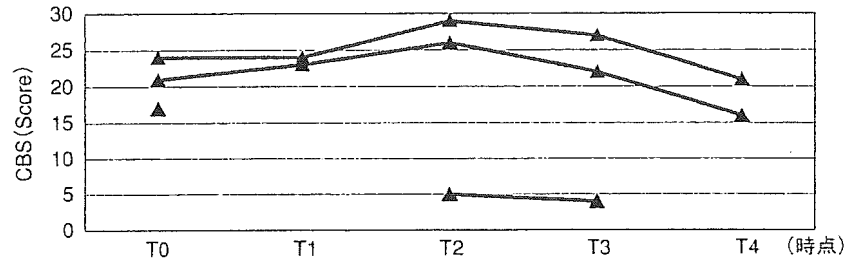


図5 重度者の経時的変化

#### b) 健康障害への認識

T0では入院したことを「よくわからない」と認識し、T1で徐々に麻痺への気づきがみられた。しかし、T4までも麻痺への気づきさえも不完全であり、Neglect行動にも気づきが見られなかった。さらに、麻痺側の脱臼という健康障害をも全く認識できなかった。

### 考 察

1) Neglectの発生頻度について、急性期から追跡調査したとき、本研究のサンプルでは初回発症RBD脳卒中患者の78.6%と高い発現頻度で出現していた。これは先行研究<sup>4,9)</sup>と一致し、NRDに伴う生活障害は重要な障害だと考えられる。

2) 従来、焦点が当たってこなかった脳卒中の急性期から、Neglect行動と生活障害に焦点を当てて、退院後6カ月の慢性期まで、その自然経過を調査し記述したという点で本研究は新しい。さらに、入院時の脳卒中の重症度分類により考察すると、入院時の重症度が中度以上であれば、急性期から慢性期にもNeglect行動と生活障害が継続することが考えられる。また、入院時の脳卒中の重症度別に、その生活障害の変化に特徴があることを示し、さらに、入院後早期から慢性期までの生活障害を予測し得るという点で意義があると考えられる。

従来、Neglect行動と生活障害について、超急性期の入院時から慢性期の退院後6カ月まで追跡した研究はない。本研究は、重症度別に軽度者はNeglectが早期に消失するという従来の知見と一致している。

次に、中度者と重度者にはT0からT4まで右手動作にも生活障害がみられた。従来Neglectは、左側の空間認知障害としてとらえられているが、本研究の対象では、Neglect行動が両手動作にも出現しており、半側性の障害ではない重要な生活障害であることを示している。これは、先行研究<sup>10,11)</sup>で示されたように、長期にわたる機能障害、セルフケア障害の1要因と考えられる。今後、NRDによる生活障害を評価する指標に取り入れ得るだろう。

しかし、中度者と重度者には違いがあり、T2、T3は生活行動拡大とともに移動動作にNeglect行動が出現する時期であり、CBS得点に変化がみられる時期だろう。しかし、中度者のCBS得点はT3、T4に改善がみられる一方、重度者はCBS得点には改善がみられず高くなった。

NRDの自然経過がいまだに不明であり、知見は得られていないため、この時期に変化した生活障害の内容に違いが生じ得るという点で、新しくこの時期に着目する必要性が考えられる。

さらに、T0からT4までに変化するものの日常生活に出現している注視の特徴は、視覚を介した方向性注意障害の兆候が出現していると考えられる。特に、中度者にみられた背後の空間からの刺激への認知障害は、外見上この障害はわかり難く、自宅退院が可能である中度者にとっては、多方向から刺激を受ける機会が多くなり、重要な生活障害である。現在、この点に関する評価やケアへの知見は明らかではない。この日常生活に現れた患者の視線の反応の特徴に注目するという知見は、従来のNeglect検査よりも簡単に観察評価でき、ケア提供に活

用できるという点で新しく有用だろう。

最後に自己の障害への認識については、中度者である程度認知能力が保たれている場合は、改善しないNeglectや障害を認識し、自分なりに向き合い工夫することが必要となると考えられる。長期的な認知面へのケアが必要であり、今後の課題だろう。

一方、重度者は、入院後早期から退院後6カ月までも、麻痺や生活障害をも認識できないという障害が明らかになった。この点に対する観察方法や対応についての知見はほとんど知られておらず、入院後早期から自己の障害への認識を患者に問う必要があるといえよう。この自己の現状認識における乖離は、「病態失認」に類似したRBDに合併する症候かもしれない。

本研究の限界には対象数が少ないことが挙げられる。今後は対象数を増やし、NRD患者の生活障害の核となる障害を構造化していく必要がある。これらが明確化できれば、入院後早期から退院後の生活障害の特性を予測し評価する看護ケアを提案できると考える。

## 結 論

NRDを有する初回発症RBD脳卒中患者9例の入院時から退院後6カ月の追跡調査から、

1) RBDでは、急性期の発現頻度からみてNRDに伴う生活障害が広く起こり得る問題であり、退院後6カ月にも重要な障害であることを示した。

2) 脳卒中重症度分類による時系列変化の特徴から、発症後早期に軽度な患者は、早期にNRDが消失し生活障害がないこと、発症後早期に中度以上の患者には、入院時から退院後6カ月までもNRDと生活障害が残ることを明らかにした。

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## Bridging Distance and Culture With a Cyberspace Method of Qualitative Analysis

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This article describes a qualitative research method that weds the cyberspace technology of e-mail with a phenomenological research approach. Examples are provided from 2 separate data sets. One data set explored the meaning of health for Japanese elders; the second explored Chinese nurses' experience of taking care of patients with severe acute respiratory syndrome. Lessons learned while using the cyberspace method are discussed, including guidance for organizing a long-distance research team, the central place of trust, and the time when e-mail communication demands to be supplemented with face-to-face interaction. The potential for bridging distance and culture with this cyberspace method is introduced for consideration and critique. **Key words:** *cyberspace, e-mail, long-distance research collaboration, phenomenological research*

**T**HIS is a story of connection through cyberspace, where colleagues who are miles apart rely on e-mail interaction to conduct qualitative data analysis. In the process of bridging distance to learn more about the health challenges faced by particular populations, these colleagues found that e-mail research collaboration also informed their understanding of each other and the cultural contexts of the study participants. The intent of this article is to share the method that enabled long-distance qualitative data analysis. Data from 2 separate studies (health for Japanese elders and caring for patients with

severe acute respiratory syndrome [SARS]) serve as examples, showing how the analysis method came alive for researchers, studying very different subject matter in unique research team configurations. To study the meaning of health for Japanese elders, a 5-person interdisciplinary, multicultural research team was formed, which included 2 nurses (1 Anglo-American and 1 Hispanic American) living in the United States and 3 Japanese, one physician, one nurse, and one psychology major, living in Japan. To study the meaning of caring for patients with SARS in China, 2 geographically separated nurses collaborated. One was a Chinese living in China and the other was an Anglo-American living in the United States.

During the last decade there has been a dramatic increase in use of cyberspace technology. Between 1996 and 2002, worldwide Internet users increased more than 10-fold, from 45 million to 544 million,<sup>1</sup> and e-mail was used by an estimated 79% of Internet users.<sup>2</sup> On the one hand, the proliferation of cyberspace technology has contributed to a sense of depersonalized information

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overload. E-mail, specifically, has been cited as a vehicle for building dehumanized "individualistic fortresses"<sup>3(p164)</sup> and likened to a "bullet in a well-aimed gun,"<sup>4(p29)</sup> permitting impulsive response without thoughtful consideration. On the other hand, cyberspace methods have shrunk the size of our world and created communication opportunities, which were unimaginable just a few decades ago. Sherry Turkle is a sociologist-psychologist who focuses on the interface of mind and machine, interactions between humans and technology. In an interview with a *Harvard Business Review* senior editor, Turkle noted that the power of the computer "to change our habits of thought extends across the culture."<sup>5(p44)</sup> The potential for cyberspace interchange to affect thinking has led to its use in a variety of health-related settings.

Nursing literature has described the use of online discussion groups to encourage critical thinking<sup>6</sup> and has reported studying the use of computers to enhance communication between healthcare providers and patients<sup>7</sup> and to teach students about theory relative to nursing practice.<sup>8</sup> Most recently, nursing literature has described qualitative data collection through Internet discussion boards,<sup>9</sup> has addressed the generalizability of qualitative data collected through the Internet,<sup>10</sup> and has called for qualitative cyber research, which is "caring, holistic and culturally sensitive."<sup>11(p317)</sup> Social psychology literature has reported analysis of chat room and discussion group interchange related to social upheaval, such as the death of Princess Diana,<sup>12</sup> and social support for health problems, such as cancer, depression, and multiple sclerosis.<sup>13</sup> Each of these research examples refers to cyberspace methods for collecting data. However, the incorporation of cyberspace methods to accomplish long-distance qualitative data analysis has not been reported.

#### LONG-DISTANCE RESEARCH COLLABORATION

Long-distance research collaboration is not a new idea for nursing. Eakes et al<sup>14</sup> reported

on processes essential for the development of a research consortium by geographically distanced colleagues to study chronic sorrow. Ludington-Hoe and Swinth<sup>15</sup> outlined the steps used to establish research collaboration between a university faculty member in one state and community hospital staff nurses in an adjoining state. However, neither of these long-distance collaborative efforts focused on qualitative analysis methods, and, generally, data analysis has been centralized rather than shared. In a recent report of multidisciplinary cross-national qualitative research studies, Treloar and Graham<sup>16</sup> reported issues of importance when collecting and comparing data from multiple international sites. The examples provided by these authors are ones where studies were planned by a primary site, and plans were sent to all investigators for comment, but little feedback was received from the collaborating sites. Analysis was done at one primary site and sent to the other sites for review upon completion.<sup>16</sup>

E-mail is a cyberspace method that allows ongoing interaction between researchers in distant sites to accomplish study planning and long-distance qualitative data analysis. The purpose of this article is to describe a method used for long-distance data analysis by wedding the cyberspace technology of e-mail with a phenomenological approach to data analysis. The van Kaam phenomenological approach<sup>17</sup> was used in developing this cyberspace method of qualitative analysis.

#### THE RESEARCH METHOD

Kaplan distinguishes research methodology from research method, while emphasizing their central relationship.<sup>18</sup> *Methodology* refers to a meta-perspective view intended to enhance understanding of the scientific inquiry process, by noting strength and weakness, potential and limitation. A *research method* is a midrange systematized scientific inquiry process<sup>18</sup> that is general enough to extend beyond a specific study and specific enough to be useful for scientific

**Table 1.** van Kaam analysis adaptation

<p><i>Phase 1: Identify descriptive expressions.</i> A descriptive expression is a statement that shares an idea about a human experience. Read and reread each participant's description. Identify the descriptive expressions, succinctly articulating them in the words of the participant.</p> <p><i>Phase 2: Reduction through synthesis.</i> This step has 2 parts. These parts occur consecutively after step 1 is completed. First, examine the descriptive expressions and group ones with a like idea together. Then, "reduce the concrete, vague, intricate and overlapping expressions"<sup>17(p.326)</sup> to identify the theme of each group of descriptive expressions. The theme is stated in the words of the researcher. The theme will appear explicitly or implicitly in most expressions and be compatible with all.</p> <p><i>Phase 3: Formulate a hypothetical definition of the phenomenon.</i> The themes, that have been synthesized in the previous step are used to create a definition of the phenomenon.</p> <p><i>Phase 4: Apply the hypothetical definition to each participant's description.</i> The fit between the hypothetical definition and the participant's description is evaluated. The fit does not have to be perfect, but correspondence is expected between the definition and what each individual described. Lack of correspondence is noted and is a source of further dialogue.</p> <p><i>Phase 5: Formulate the structural definition.</i> The structural definition integrates dialogue regarding lack of correspondence with the hypothetical definition.</p>
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pursuits. In his 1969 work, van Kaam<sup>17</sup> outlined an approach for phenomenological analysis on the basis of 2 assumptions: (1) a large sample of cases from which a random sample of cases was drawn and (2) "intersubjective agreement" among expert judges to assure that emerging findings accurately reflected empirical data. The adaptation of the van Kaam phenomenological approach (Table 1) described in this article does not assume random sampling from a larger sample. However, intersubjective agreement is naturally woven into its fiber because the proposed method assumes the collaboration of at least 2 geographically distant researchers who compare interpretations and pursue concurrence at each phase of data analysis. Intersubjective agreement is a consensus pursuit that includes openness to hear and clarify what the other is saying and recognition of unique views that contribute to comprehending a complex whole. The phases of data analysis based on van Kaam's approach for phenomenological research (Table 1) will be presented with issues that arise when moving through the phases in cyberspace. Pursuit of intersubjective agreement will be illu-

minated as will cultural exchange occurring during analyses.

#### BEGINNING THE WORK

Prior to beginning the analysis, it was necessary to establish a framework for e-mail exchange. Other than one researcher (P.L.), none of the research collaborators had previous experience in conducting qualitative analysis. Therefore, the collaborator with experience took the lead to (1) propose the van Kaam analysis adaptation, (2) structure discussion about doing phenomenological analysis as an e-mail process, and (3) communicate with others to establish a time frame for completion of analysis. Successful accomplishment of data analysis requires that one person assume organizing responsibility as a team leader, while engaging all research collaborators in each phase of analysis. The Chinese study is at an earlier stage of analysis compared to the Japanese study (Table 2). Therefore, specific examples from the Japanese study will be shared through the second phase of analysis, whereas examples

**Table 2.** Comparison of Japanese and Chinese research projects

Research question	What is the meaning of health for Japanese elders who have had a stroke?	What is the experience of caring for patients with severe acute respiratory syndrome (SARS)?
Participants	<i>N</i> = 24 Japanese elders	<i>N</i> = 7 Chinese nurses who had cared for patients with SARS
Research team members	Five multidisciplinary, from Japan and the United States—all Japanese team members are bilingual	Two single discipline, from China and the United States—the Chinese team member is bilingual
Methods	Secondary analysis of 4-min dialogue conducted for another study—audiotaped, transcribed, and translated	Prospective design with analysis of 45-90 min in-depth dialogue—audiotaped, transcribed, and translated
Question(s), statement(s) guiding dialogue	<ul style="list-style-type: none"> <li>• Describe what it means to you to be healthy.</li> <li>• How do you know you are healthy?</li> </ul>	<ul style="list-style-type: none"> <li>• Tell me about your experience of caring for patients with SARS.</li> <li>• What were the challenges that you faced?</li> </ul>
Stage of completion	Phase 3 of data analysis (Table 1)	Phase 1 of data analysis (Table 1)

from the Chinese study will demonstrate what was happening in the first phase of analysis.

**PHASE 1: IDENTIFY DESCRIPTIVE EXPRESSIONS**

**Health for Japanese elders**

In this first phase of analysis (Table 1), each team member identified the descriptive expressions occurring in the transcriptions about health for Japanese elders. This was easier to accomplish with the Japanese health transcriptions than with the SARS transcriptions because these were short and, therefore, generated a smaller number of descriptive expressions (Table 2). What made the Japanese health analysis complex was the number of multidiscipline collaborators who had to agree on a set of descriptive expressions. Each collaborator identified descriptive expressions of health. The Japanese collaborators met, compared their descriptive expressions, and came to a consensus on a set of descriptors before e-mailing them to the

team leader in the United States, who then had her own expressions, the Japanese team members' expressions, and the expressions of one other American collaborator to synthesize. The synthesized list of descriptive expressions were e-mailed back to all research collaborators and cyberspace discussion ensued to arrive at a consensus about the fit between the synthesized list of expressions for one research participant's dialogue about the meaning of health. The team analyzing the meaning of health for Japanese elders had made a decision that each member would analyze one designated participant's dialogue each week, and all collaborators would send their analyses to the team leader in the United States on a given day of the week. This process was generally followed except for times of heavy commitments, vacations, or family emergencies. The team leader proceeded to do the synthesis only when all team members' input was available. The team members consistently informed each other about when they would be able to submit their next research participant analysis. So, emails generally contained descriptive expressions

for the next study participant, critique of previously synthesized expressions, and comments about life, which let the other collaborators know when to expect the next analysis e-mail.

The following excerpt is an example of cyberspace discussion regarding one participant's dialogue about the meaning of health (Table 3). After reviewing the descriptive expressions submitted by the research collaborators, the team leader synthesized and

e-mailed these descriptive expressions to all the team members:

- The most precious thing
- Having fun with anything she does, like work, going out, and playing with the kids
- Doing her best with her own policy without unnecessarily troubling others but requesting assistance when needed
- Working hard as a housewife with no regrets about that if she died

**Table 3.** One participant's dialogue about health

<p><i>What does it mean to you to be healthy?</i>          Being healthy is the best pleasure. If I were healthy, I could work, anything I do would be with fun, meals, going out, and playing with kids, anything I do would be fun to do. I do not want money, the health is most precious, and especially after I got this illness I think so more than ever strongly. Despite of how hard I had been working, this happened . . . well, I guess with my age, maybe this is how things go. But I was surprised, until now I never thought there would be this many patients. In my room I was talking to other patients that health is the most precious thing. My children, I have ten grandkids, too, come visit me often here. I, as a housewife, had been working very hard on the duty as a housewife and I tell my daughter I can die with no regret on that. My daughter laughs at me saying there is nobody like that. Well, I think people are people and I am me. I had been living with my own policy, but, in return, I never troubled other people. I had always done my best, in the way, of course, trying to get what I need—on anything.</p> <p><i>Trying to get what you need?</i>          Yes, that is, for example, being here in the hospital even, I do not hesitate to ask nurses to do things that need to be taken care of, but I do not ask them to do any more than that. I encourage those people who are hesitant to ask nurses for help. Some people do not push the call button of their own for help but wait until a nurse shows up to answer other roommates' call. I tell them that is not the way, I tell them that you have to call with your own button and ask directly for what you want otherwise a nurse comes to help someone else and leaves. There are so many people who do not understand that. So I tell them that is not good, not good at all. I tell what I think directly to people . . . well, I had been living that way all my life. That was how I could survive. With your age you probably have no experience in such situation, but after the war I had two children, during the war I had five, and my husband was taken to the war as a soldier. So for two years I was left alone to raise children. We had to evacuate to outside of Tokyo but me and my husband both of us were from Tokyo and we didn't have any relatives where we could go evacuate. Someone my husband met during the war had introduced us to his relative in the countryside. All I had was my 5 children and the postcard from my husband's war friend that tells his relative in the country about us needing a place to evacuate. I had to go through so much trouble. Even after the war, there was nothing. No food, no nothing. Even if you had money, there was nothing to buy.</p> <p><i>Nothing to buy?</i>          No. I went through that. After we came back to where our house used to be, the house was burned down. My relative took us in and had us stay there for 3 years. I sold all my kimonos and with that money I started the pickle shop. On the house we rented there was an open space so I did pickle shop there. The house, we only had a roof to avoid rain, no windows, we couldn't pay for them. We put the door in the toilet with the first profit from that shop . . . that was the only door we had in the house. I went through that.</p>
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- Surviving the troubles of war to open a pickle shop
- Surprise with having a stroke despite hard working but guessing that things go this way with age

The e-mail response from the Japanese team members included the following:

*With the last one (descriptive expression), she meant "surprise" differently in her talk. She's "surprised" to see this many patients. She never thought there would be this many patients until she gets sick and hospitalized to share a room with bunches of sick people, like her age. And then, she was surprised to find out that there were this many patients. It's hard to know exactly which part "surprised" was related to when you have just the words to read instead of hearing the emphasis of the conversation.*

This comment was made by the Japanese team member (C.N.) who had done the dialogues with the patients, and the other Japanese team members were in agreement. In rereading the words of the participant, the American collaborators could see the perspective being shared by the Japanese team. In response to this interaction the team leader changed the last descriptive expression to

- Having this illness despite hard work but guessing things go this way with age.

Another discussion that occurred about this time with the study of the meaning of health for Japanese elders focused on judgments about health...good health...bad health. We decided to consider the dialogues with a view that health IS...not good or bad...but whatever the participant says about life experience during this 4-minute dialogue when asked about health. So, the assumption was that life experience is health experience. Rather than looking for what we researchers label health, we were staying true to what the elderly research participant introduced. "Elderly people interweave health experience into the outline of their life history. They always revise the conclusion of the story."<sup>19(p61)</sup> This logically led to

additional conversation about the expanded present moment, which includes past and future. The participant who talked about war experiences and opening a pickle shop was bringing the past to the present moment of survival. The assumption that the meaning of health was reflected in the expanded present moment was accepted by the research team.

The discussion about assumptions to be held while analyzing data occurred in the midst of analyzing and demanded time and patience while sorting through values, questions, and misunderstandings. This work was initiated with e-mail questions but much of the work was done when one of the Japanese team members visited the United States and was able to converse face-to-face with the American team members, videotaping the interaction and returning to Japan to share what transpired. There are times when face-to-face interactions go a long way to support continuing e-mail analysis and videotaped transactions are a useful supplement. There have been a total of 3 face-to-face interactions, with different configurations of Japanese and American team members, which have occurred over the 18-month course of this analysis.

#### Caring for patients with SARS

Since the Chinese-American team is in an early stage of analysis, all interaction has occurred by e-mail. There may come a time when it will be necessary to meet at some critical point of moving the analysis forward. Several transcript excerpts from the nurses caring for patients with SARS, with questions from the American collaborator (P.L.) and responses from the Chinese collaborator (H.L.) follow:

*Nurse caring for patient with SARS:* A lot of nurses I have contacted said if they contract SARS, they would not let us treat them. They wanted to die. I asked them why and they said, lonely, too lonely.

*P.L.:* I am not sure that I understand what the transcription is saying...do the nurses think that being a SARS patient is "too lonely"?



*H.L.:* Yes, they think it's too lonely being a SARS patient. They don't want to be like that if they get the disease.

*Nurse caring for patient SARS:* In our shift there was a very severe patient. He already had some air under the skin. In fact, he was not so severe at first but his psychological quality was not good, his pressure was so big. He was always thinking about how his family was, how much he had spent, could he be cured?

*PL:* When the nurse talks about pressure being big, is she talking about blood pressure?

*H.L.:* She means the stress. In Chinese, we like to say "pressure."

In the first phase of analysis of the SARS data, this questioning process was a time-consuming step to be sure that the American collaborator understood what was being described. The Chinese collaborator returned to the original Chinese audiotapes to ascertain meaning when there was a question. Then, each collaborator identified the descriptive expressions. The expressions were shared and the American collaborator synthesized and returned the expressions for review by the Chinese collaborator. The following examples are ones where there was an interchange between the collaborators about one of the synthesized descriptive expressions.

*Descriptive expression synthesized by PL:* Being unable to drink, eat, and go to the toilet, which are restraints practiced in the wards before coming to the SARS unit.

*H.L.'s response:* That is the situation when you are working in the SARS unit not prior to coming to the unit.

*Descriptive expression synthesized by PL:* Planning suction procedures, including position for suction to avoid exposure to contaminants, before entering the unit, where thinking can be difficult.

*H.L.'s response:* The statement is okay but it needs to put emphasis on spending less time in the contaminated area to avoid exposure.

The work of phase 1 demands that the research collaborators establish a common ground so that e-mail exchange can flow

easily and thoughtfully. A core group of researchers (P.L., R.T., C.N.) from the Japanese study had been working together on research for 6 years,<sup>20-22</sup> and had collaborated on the original study, which generated the meaning of health data.<sup>21</sup> In contrast, this is the first effort by the American and Chinese collaborators to conduct long-distance research, although they have known each other for more than a decade, beginning with a graduate education experience. In this instance, the Chinese researcher consulted with the American researcher before she began to study nurses caring for patients with SARS. In both collaborations, the passage of time and ongoing relationship between team members has built trust, which is a critical dimension of the common ground for e-mail exchange.

Beyond the common ground of trust, this cyberspace analysis method requires commitment to adhere to the time frame for analysis completion, openness to discuss ideas, which generate questions for any one of the collaborators, and patience, knowing that the analysis is proceeding toward completion. The pursuit of intersubjective agreement, apparent in this first phase of analysis, is a thread connecting all the phases.

## PHASE 2: REDUCTION THROUGH SYNTHESIS

This second phase of analysis (Table 1) begins after phase 1 is completed, when all collaborators have come to a consensus on the descriptive expressions for all participants. Because the study of nurses caring for patients with SARS has not yet moved beyond phase 1 of data analysis, specific examples for this phase will come from the study of Japanese elders. In the Japanese study, a master list of descriptive expressions grew from week to week over a 9-month period. New expressions were added as the team agreed on their acceptability. There were 103 descriptive expressions about health for the 24 participants in the Japanese study when phase 1

of analysis was completed. By contrast, there were 24 descriptive expressions on the master list for only the first nurse participant in the Chinese study, where in-depth dialogues lasted 45 to 90 minutes.

To begin reduction through synthesis, descriptive expressions were grouped, so that like expressions were placed together, and then a theme was designated in the words of the researchers. The theme synthesized the central idea from a group of descriptive expressions and was compatible with all of the expressions. Each collaborator grouped the expressions and before proceeding to identifying the theme, intersubjective agreement was sought about the groupings. This work of agreeing on grouping and then naming themes, occurred independently with the 2 American and the 3 Japanese collaborators. Then the American and Japanese collaborators had a face-to-face meeting with all team members present to discuss the groupings and themes. This part of the analysis occurred over a week, with several hours of each day devoted to clarifying what was unclear and reaching out to understand each other's views about determining groupings and naming themes. The collaborators had considered the possibility of doing this through live video streaming over the Internet, but opted, instead, for a face-to-face meeting. It was the first time that all collaborators had come together to meet each other and discuss the study data. A regular occurrence during this week of analysis was a request from the Japanese team for a private 15- to 20-minute meeting that excluded the Americans. The leader of the Japanese team (R.T.) explained that it was sometimes difficult to "think in English" and he wanted to be sure that the Japanese team members were "on the same page" before proceeding. The following is an example of descriptive expression grouping (redundancies have been eliminated) and theme naming:

- The most precious thing
- A fundamental energy to live
- Something irreplaceable and the most important thing in the world

- Recognizing importance for someone who is by himself
- A base of survival even if you don't have much
- Something she thought about for the very first time after getting sick, when she realized its importance
- Thanking Buddha for inherited strong body and family that gets along well

The theme for this group of descriptive expressions about the meaning of health was "fundamental valuable gift."

### PHASE 3: FORMULATE A HYPOTHETICAL DEFINITION OF THE PHENOMENON

In phase 3, all the themes are synthesized (Table 1) to define the phenomenon of interest—health, in the case of the study of Japanese elders, and caring for patients with SARS, in the case of the study of Chinese nurses. Like all other phases of analysis, this phase will be an iterative process of coming to agreement. The preferred approach to this phase of analysis is group work to create the hypothetical definition. Therefore, it is best done in face-to-face dialogue while all collaborators are physically present or present with live video streaming. The theme-naming component of phase 2 and formulation of the hypothetical definition rests on the attention to intersubjective agreement in the previous phases and trust that collaborators have developed to creatively compose a definition that is true to the participants and reflective of their cultural context. At this stage of analysis, the cultural knowing of the collaborators who share a context with the study participants is most important, taking precedence in the creation of the hypothetical definition.

### PHASE 4: APPLY THE HYPOTHETICAL DEFINITION TO EACH PARTICIPANT'S DESCRIPTION

The central task of phase 4 (Table 1) is one that takes each collaborator back to the original transcripts, making note of places

where the hypothetical definition is inconsistent with the words of the participant. This may be done face-to-face or with e-mail. If done with e-mail, all inconsistencies would be e-mailed by a given time to all collaborators, and once again dialogue would ensue to resolve issues of misfit, pursuing agreement about correspondence between the words of the participant and the hypothetical definition.

#### PHASE 5: FORMULATE THE STRUCTURAL DEFINITION

In this last phase of analysis (Table 1), a structural definition of the phenomenon of interest is proposed. This definition integrates what was learned during phase 4. Neither the study of health for Japanese elders nor the study of caring for patients with SARS has reached this phase of analysis, but patterns of interaction assuring intersubjective agreement that have been established early on will continue to be important as the data analysis proceeds to completion.

#### CYBERSPACE QUALITATIVE ANALYSIS LESSONS

Table 4 provides a list of 6 lessons learned during collaborative cyberspace qualitative data analysis. Although the first lesson suggests the designation of a qualified leader, the process actually begins sooner, when professionals from distant geographies get to know each other and begin a process of build-

ing trust. Trust is the warp, the foundation threads that create the space for weaving, and these lessons are the cross-threads composing the fiber of the cyberspace method. The lessons are woven through the threads of trust.

Fukuyama<sup>23</sup> defines *trust* as the expectation for regular, honest, and cooperative behavior. He talks about social capital as a trust-based capability for community building and he identifies spontaneous sociability as a subset of social capital.

In any modern society, organizations are being constantly created, destroyed and modified. The most useful kind of social capital is often not the ability to work under the authority of a traditional community or group, but the capacity to form new associations and to cooperate within the terms of reference they establish.<sup>23(p27)</sup>

Although Fukuyama's words were directed to business groups, they are relevant for the qualitative analysis method described in this article. To some extent, the cross-cultural research teams are communities of scholars who spontaneously come together and then begin structuring their cooperation to address an area of shared research interest. Designation of a qualified leader is a natural "first step" and determination of "terms of reference" for the collaborative work comes next.

In this context, the terms of reference include agreement about a time frame for completion of analysis with long- and short-term goals. Implicit in this agreement is commitment and the willingness to endure through each phase of long-distance data analysis. Willingness to endure is an inherent quality

**Table 4.** Lessons learned about a cyberspace method of qualitative analysis

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| <ol style="list-style-type: none"> <li>1. Designate a leader who has experience in qualitative analysis</li> <li>2. Establish a time frame, including long-term (analysis completion) and short-term (participant-by-participant analysis deadlines) goals</li> <li>3. Address emerging beliefs, questions, and misunderstandings as they occur</li> <li>4. Defer to the cultural knowing of the collaborators who share the context of the study participants</li> <li>5. Pursue intersubjective agreement throughout the process</li> <li>6. Plan face-to-face meetings at critical creative analysis junctures</li> </ol> |
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for success in the Confucian tradition,<sup>24</sup> which was a foundation for most of the researchers collaborating on this work. There were many times when the patient persistence of the Japanese or Chinese collaborators nudged the Americans to stick with the process and move forward. However, there were also times when the Americans initiated the nudging, reminding us that willingness to endure may be a human quality that extends beyond Confucian cultures. As long as the habit of enduring surfaced in one member of the research team at any point in time, the analysis process was moving forward and other collaborators were inspired to remember their commitment.

Lessons 3, 4, and 5 (Table 4) are ones that add a dominant thread of culture to the fabric of the method. Beliefs, questions, and misunderstandings that arise in the pursuit of intersubjective agreement often incorporate cultural dimensions. For instance, in the Japanese study of the meaning of health, one of the research participants mentioned "bone picking" in his description. The question from one of the Americans was: "Okay Japan team . . . I need a cultural lesson here . . . what is bone-picking?" The Japan team responded that this was part of the last goodbye at the funeral ceremony, after cremation, when selected people pick bones with chopsticks for placement in the burial urn. "Bone-picking is done in a pair, two people pick one piece of bone together and put it in the urn." This interchange highlights the cultural nature of questions and beliefs that interweave with the threads of trust to create the fabric of the method, and it suggests "the intricate complexities of cultural distinctions,"<sup>20(p57)</sup> which enriched the personal experience and strengthened collegial connection.

All collaborators, including the team leader, relate to each other as peers through e-mail interaction to reach intersubjective agreement. Lee<sup>25</sup> notes that e-mail use by people from East Asian countries is hindered when the intent to show respect separates some individuals from others, thwarting the poten-

tial for e-mail exchange to generate critical reflection. In this cyberspace research method, critical reflection goes hand-in-hand with self reflection. Turkle<sup>5</sup> observed that "people who make the most of their 'lives on screen' are those who approach on-line life in a spirit of self-reflection."<sup>5(p46)</sup> Turvalon and Murray-García<sup>26</sup> advocate for cultural humility, which demands a life-learning process of self-reflection to consider ones personal values and biases. *Cultural humility* is the quality of forgoing expert judgment to be receptive to the unique understanding and expression of others from other cultures. In discussing the research method, we introduced cultural knowing, acknowledging that collaborators from the cultural context of research participants have a grasp on meaning most closely aligned with participants. In the examples of Japanese and Chinese studies, it was necessary for the American collaborators to rely on cultural humility and defer to the cultural knowing of the Japanese or Chinese team members.

The final lesson is one that emerged unexpectedly but was critical to progress: face-to-face meetings at creative turning points in the analysis. "The face-to-face meeting will be a better communication tool than devices such as e-mail since it provides bountiful cues besides written words."<sup>25(p231)</sup> E-mail is best used for the participant-by-participant analyses, where a segment of data can be simultaneously addressed by multiple collaborators. Synthesis across study participants lends itself to face-to-face interaction, where expressions beyond words can be recognized and discussed in the moment. Technologies that enable face-to-face meetings between collaborators in distant sites demand further exploration as this cyberspace qualitative research method develops.

## CONCLUSION

In *Being Digital*, Nicholas Negroponte predicted that e-mail will become a dominant mode of interpersonal connection,