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# 博 士 論 文

Adaptation of the Neuman systems model for support of people with  
mental illness offered by public health nurses in Japan

(日本における保健師の精神障害者への支援へのニューマンシステムモデルの適用)

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# Adaptation of the Neuman systems model for support of people with mental illness offered by public health nurses in Japan

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## Abstract

**Aim:** In Japan, ongoing changes to national mental health policies require public health nurses to consider playing a role in providing support to people with mental illness among mental healthcare teams in the community. Using the Neuman systems model (NSM), we attempted to develop a model of public health nurses' support for people with mental illness. This study aimed to explore whether the NSM could be used in providing support to people with mental illness in the community.

**Methods:** First, we adapted the NSM to make a draft support model. Second, we conducted a nationwide questionnaire survey of expert public health nurses experienced in providing individual support to people with mental illness (N = 75).

**Results:** The draft support model was verified by asking the nurses to comment on the appropriateness and their agreement of the model using 20 ideas from the NSM. The nurses supported the appropriateness of the draft support model and agreed with the ideas, each with a score of >80%.

**Conclusions:** This approval rate indicated that the draft support model could be applied to the support offered by public health nurses to people with mental illness in Japan.

## Key words

Public health nurses, Community-based support, Mental illness, Neuman Systems Model, Applicability

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## Introduction

Globally, mental health policy is moving toward “deinstitutionalization,” moving people out of psychiatric hospitals to care in the community <sup>1)</sup>. In Japan, the number of psychiatric care beds has been decreasing steadily since the Ministry of Health, Labour and Welfare released their report titled “Visions in Reform of Mental Health and Welfare” in 2004. Despite this policy shift, Japan retains a larger number of psychiatric beds per capita in comparison with other countries of the Organisation for Economic Co-operation and Development (OECD), particularly beds for long-stay patients. In 2011, for example, the OECD average was 68 beds per 100 000 population, which starkly contrasted with the 269 beds per 100 000 population in Japan, although this is somewhat expected given the deinstitutionalization process that was started >50 years ago in some OECD countries <sup>1)</sup>. In contrast, Japan has only recently started to move care from hospital to community-based settings. The system of mental healthcare in Japan has therefore undergone several changes to meet the increasing demands of community-based support.

In Japan, public health centers (PHCs) have legal responsibility for providing community support to people with mental illness. However, since the government created the National Outreach Project in 2011 (henceforth referred to as the Project), the role of PHCs has been ambiguous. Because the Project does not specify the requirements of PHCs, each PHC has come to a different understanding of their roles <sup>2)</sup>. Public health nurses (PHNs), comprising the largest workforce in PHCs, have historically played an important role in supporting people with mental illness by coordinating community care resources, such as home visits. However, under the terms of the Project, medical outreach teams are required to ideally provide home visits to those with mental illness who are untreated or abandon their treatment. In this context, Kayama <sup>3)</sup> pointed that PHNs must still utilize their accumulated professional experience in support of the Project. In this way, because the role of PHNs has constantly evolved in response to changing national health policies, their exact role in community mental healthcare remains unclear.

In community mental healthcare in Japan, the activities of PHNs focus on two perspectives. The first is to consider the community as the client, which involves attempting to improve situations in the community that exacerbate mental health problems or that could lead to mental illness. The second is to consider the individual or family, within the community, as the client. PHNs must, therefore, cover all levels of primary, secondary, and tertiary prevention. Because nursing philosophy encourages a holistic view of the person, his or her health, and the environment, PHNs can have particularly effective roles in providing individual

support to people with mental illness in the community.

Although no studies have yet clearly described the roles or ideas of expert PHNs, those of community mental health nurses (CMHNs) have been described. Most roles performed by CMHNs include case management, counseling, medication management, and family support <sup>4)5)</sup>. Moreover, the central role of CMHNs as defined by researchers is to assist people with mental illness in order to maintain and achieve their highest level of functioning and independence within the community <sup>6)</sup>. However, it is still unclear how CMHNs or PHNs perceive and perform the activities within their roles, with limited research conducted to determine the nature of support offered by PHNs to people with mental illness.

To resolve these problems, we decided to develop a model for providing support to people with mental illness based on the roles and ideas of expert PHNs. We anticipated that such a model could guide PHNs to improve their working practices and that it could be equally useful to other healthcare professionals who deliver care within the community. As the first step, we conducted a preliminary survey and made a draft support model for people with mental illness, which was adapted from the Neuman systems model (NSM) <sup>7)</sup>. We aimed to explore whether the NSM could be applied to the support offered by PHNs to people with mental illness in Japan.

## **Methods**

### **Process of making the draft support model based on the NSM**

Prior to making the draft support model, we conducted a semi-structured in-depth interview with two expert PHNs who each had a key role in a Project for people with mental illness run by the local government. We then identified two main roles of PHNs in supporting people with mental illness: continuous support and preventive intervention. On the basis of the result extracted from the interview, the NSM was chosen as the basis for our model for two main reasons. First, the NSM conceives of support as a cycle of primary, secondary, and tertiary prevention, and includes the concept of preventive intervention. Second, and perhaps more importantly, the NSM has key concepts in common with the basic ideas of support offered by PHNs. The NSM's holistic way of looking at the whole client and their relationship with the environment is similar to the way PHNs view the health and lifestyle of their clients in the community in terms of total wellbeing. These similarities mean that the NSM is frequently used as the basis of public health nursing in many countries <sup>8)</sup>.

To simplify the model, we excluded some frames such as “personal factors,” “stressors,” and “interventions” from the original one and changed several words to

suit the support offered by PHNs. To assess the validity of the draft support model adapted from the NSM (hereafter the “Adapted Support Model”), we performed a group interview of six PHNs working in PHCs in 2013. All PHNs had an experience of offering individual support to people with mental illness and an average of 20 years of experience. The adapted model was then refined based on their opinions. Frames outlining the PHNs’ roles and the client’s goal were added. The phrase “implication in preventive support” was added along with directional arrows based on the opinions (Figure 1). In addition to the Adapted Support Model, we made an assessment table to assess the support needs of clients corresponding to the elements of the Model referring to the Assessment and Intervention Tool Development Guide by Neuman <sup>9)</sup> (Table 1). The assessment table included assessment targets, view point of the assessment, and the elements deciding the overall client wellness with examples.

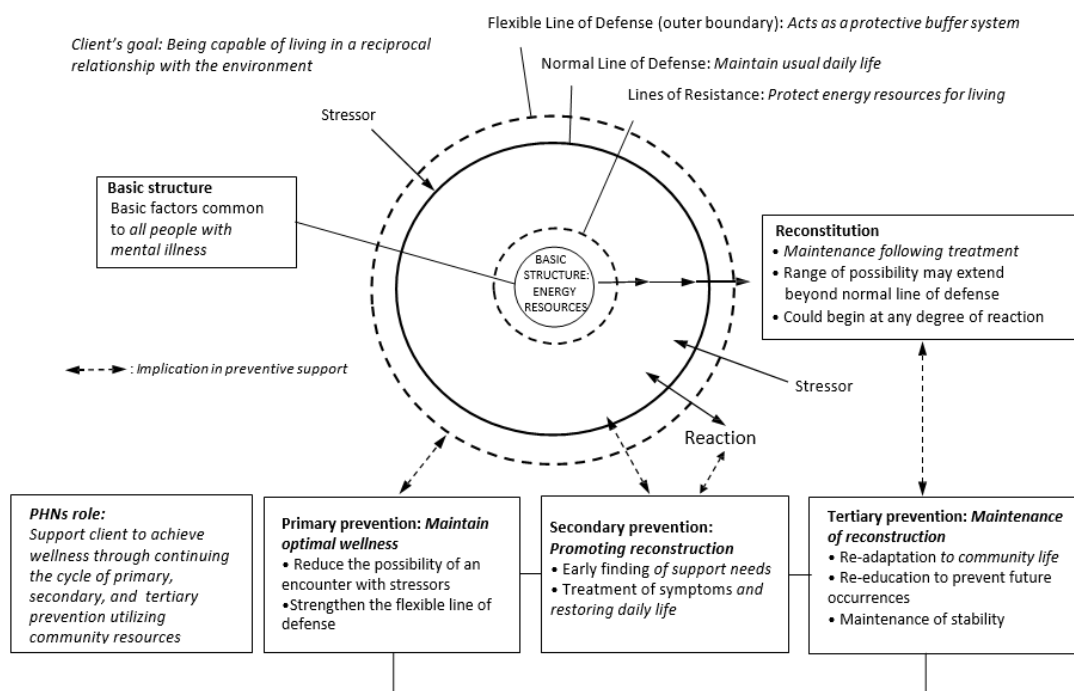


Figure 1. Model of support by public health nurses for people with mental illness, adapted from the Neuman Systems Model <sup>7)</sup> (original diagram copyright 1995 by Neuman B.) The italic letters are added in this study. Abbreviation: PHN, public health nurse

Table 1. Assessment of clients' support needs in the Adapted Support Model <sup>9)</sup>

**Purpose:** Determine the variance from wellness and objectively identify the support needs for preventive care (primary, secondary, and tertiary).

**Procedure:** Assess each target<sup>a</sup> considering five elements<sup>b</sup> and comprehensively determine the wellness level.

| Assessment targets <sup>a</sup>                  | Viewpoint of assessment                                                                                                                                | Five elements <sup>b</sup> for deciding overall client wellness with examples                  |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>About immediate problem</b>                   |                                                                                                                                                        |                                                                                                |
| Stressor                                         | Actual stress factors causing reaction.<br>Potential stress factors.                                                                                   | 1. Physiological<br>• state of the disease<br>• bodily functions                               |
| Reaction                                         | Nature and degree of reaction and likely progress.<br>Possible reaction to potential stressors.                                                        | 2. Psychological<br>• mental processes<br>• human relationships                                |
| <b>Functional competence to control wellness</b> |                                                                                                                                                        |                                                                                                |
| Basic structure                                  | Factors threatening survival energy.<br>Some kind of urgent risk factor.                                                                               | 3. Sociocultural<br>• state of the client's finances<br>• family structure<br>• social support |
| Normal line of defense                           | Level of the client's usual vitality and factors affecting it<br>(factors that have prevented stressors and allowed the client to continue daily life) | 4. Developmental<br>• life developmental process<br>• experience of suffering disease          |
| Lines of resistance                              | Resistant factors which reverse the reaction to stressors<br>(advantages in the reconstitution of the client's usual daily life)                       | 5. Spiritual<br>• influence of spiritual belief<br>• some kind of individual belief            |
| Flexible line of defense                         | Advantage of maintaining reciprocal relationship with environment.                                                                                     |                                                                                                |
| Probability of reconstitution                    | Forecast degree of complete reconstitution.<br>(range of possibility may extend beyond usual wellness level)                                           |                                                                                                |

## Participants

We included PHNs working at PHCs and who had experience of offering individual support to people with mental illness. In December 2013, we sent explanations of the study to all PHCs in Japan (N = 494), asking if they would cooperate in the study. We needed to recruit only expert PHNs for the specialized questionnaire survey. For inclusion criterion, participants were required to have more than seven years of experience in providing individual support to people with mental illness (hereafter “length of experience providing individual support”). According to Benner's research <sup>10)</sup>, nurses move through five levels of competence: novice, advanced beginner, competent, proficient, and expert. The expert level is generally considered to include those with three to five years of experience in similar situations. However, we decided to define experts as those with more than seven years of experience in providing individual support to people with mental illness, in the hope that we would learn the most from those with more experience. One or two of the most experienced PHNs who met the inclusion criterion at each PHC were requested to participate in the survey. The PHCs were sent information about the Adapted Support Model and a sample questionnaire. Of 494, 74 PHCs returned positive responses and requested questionnaires. There were 108 candidates in total.

The study was approved by the ethical committee of Kobe University,

Graduate School of Health Sciences (approval no. 255).

## Questionnaire

To examine the applicability of the Adapted Support Model, we selected 20 ideas from the NSM <sup>7)</sup> that described the support offered by Japanese PHNs to people with mental illness in Japan (Table 2). Seven were chosen as basic ideas that were congruent with the concept of the Adapted Support Model (basic domain). Another seven were chosen as assessment concepts that could help explain the viewpoint of assessment (assessment domain). In addition, six were chosen that corresponded to the PHNs' cycle of preventive support in the Adapted Support Model (support domain). Considering Japanese context and culture, all 20 ideas were translated in Japanese and modified.

Table 2. Twenty statements of ideas of the Adapted Support Model

| Item number       | Statement                                                                                                                                  |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Basic domain      |                                                                                                                                            |
| B1                | The client has his or her own purpose of wellness control.                                                                                 |
| B2                | The goal of wellness is to be capable of living a reciprocal relationship with the environment.                                            |
| B3                | The function of a PHN is to facilitate the client's own control of wellness.                                                               |
| B4                | The client is in constant change, moving either toward a state of wellness or toward one of illness.                                       |
| B5                | The client's health problem is part of a whole holistic aspect of wellness.                                                                |
| B6                | The client is considered to be in a reciprocal relationship with their environment.                                                        |
| B7                | A PHN's assistance for the client comes from an aspect of preventive healthcare.                                                           |
| Assessment domain |                                                                                                                                            |
| A1                | The aim of assessment is to grasp the needs of caring.                                                                                     |
| A2                | Clarification of health deviation from a client's usual wellness level is necessary to provide reasons for appropriate care.               |
| A3                | Client's reactions and their causes are the main objects of assessment.                                                                    |
| A4                | To grasp the client as a whole, the client's current functional competence of wellness control should be assessed.                         |
| A5                | The state of their ability of managing stressors to live in the community is considered to be the client's usual wellness level.           |
| A6                | The main factor threatening wellness is comprehensively clarified by reviewing and relating all assessment data.                           |
| A7                | The five variables (physiological, psychological, developmental, sociocultural, and spiritual) should be taken into account.               |
| Support domain    |                                                                                                                                            |
| S1                | PHN's support consists of three stages of prevention as intervention, responding to the process of the client's control level of wellness. |
| S2                | Primary prevention as intervention, is to support the client in their ability to cope with future stressors.                               |
| S3                | Secondary prevention as intervention, is to discover client's reaction to stressors at an early stage and begin treatment.                 |
| S4                | Tertiary prevention is to support the client in their ability to maintain wellness.                                                        |
| S5                | A PHN supports the process of a client's control of wellness through these three stages of prevention.                                     |
| S6                | Tertiary prevention tends to lead back, in a circular fashion, to primary prevention in a continuing cycle toward wellness.                |

Before answering the questionnaire, the participants were asked to read information pertaining to the Adapted Support Model. They were then asked a preliminary question about their understanding of the outline of the Adapted Support Model (1 = understand well, 2 = almost understand, 3 = hardly understand, and 4 = not understand at all). Those who chose 1 or 2 were asked to answer the subsequent questions.

In the questionnaire, PHNs were asked their opinions about the Adapted

Support Model from two perspectives. In Section 1, they were asked whether the concept of the Adapted Support Model reflected each of the 20 ideas. In Section 2, they were asked whether they agreed with each of the 20 ideas of offering support to people with mental illness.

In both sections, the participants were asked one question for each of the 20 ideas (i.e., 2 per idea; 40 questions in total). In Section 1, they were asked to respond on a 5-point scale, ranging from 1 (not reflected at all) to 5 (reflected well). In Section 2, they were asked to respond on a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). If they had no idea on how to answer a given question, they were requested to select option 3 (neutral).

The questionnaire was also used to collect details of the participants' individual characteristics, including age, length of career as a PHN, length of experience providing individual support, and current position at work. In addition, we asked whether they had any experience of working with a national or prefectural model project for community-based support for people with mental illness.

#### **Data collection**

Data collection was conducted from January to February in 2014. We sent out 108 sets of questionnaires to the participants at 74 PHCs. Each set included an explanation of the study, information about the Adapted Support Model, a questionnaire, and a stamped self-addressed return envelope. All participants were also informed about the aim of the study, and their participation was voluntary using a written explanation regarding the ethical considerations. The questionnaire was anonymous, and each respondent was responsible for mailing it once completed. Of the 108 questionnaires, 79 (73.1%) were returned. Despite the experience limit set in the inclusion criterion, seven respondents had less than seven years of experience. However, we included these as eligible participants after further investigation; all seven had careers as PHNs for more than eight years (range 8–34), and four had experience of working with a model Project. Of the 79 respondents, 75 (95%) indicated overall understanding of the Adapted Support Model (choosing response 1 or 2 to question 1) and moved on to answer the subsequent questions.

#### **Data analysis**

We statistically analyzed the responses of the 75 participants. There were nine missing values to the 5-point Likert scale questions from eight respondents; these were replaced with option 3 (i.e., “neutral” or “no idea”). This was done because we surmised that the highest possibility of failing to complete the questionnaire would be due to its thought-provoking nature. Data for Sections 1 and 2 were assessed in the same manner.

The data characteristics of the question responses were examined by

frequency distribution for each item. We decided that more than 16 items needed to have a mean score higher than four (80% of the total number of 20 items). Reliability was assessed by measuring the internal consistency from the item values for each domain and section, and was deemed good if Cronbach's alpha was 0.70 or above <sup>11)</sup>. To assess the level of appropriateness and agreement, we calculated each domain score and section score by adding the item scores. The level of agreement was considered good if the mean domain score was higher than 80% of the highest range in each domain.

The relationships between the item scores of Sections 1 and 2 were examined using Spearman's correlation coefficients. We examined the relationship between participant characteristics and these section scores. Spearman's correlation coefficient was used to evaluate the association between participant characteristics (age, length of PHN career, and length of experience providing individual support) and each domain score. Analysis of variance (ANOVA) with F-test was employed to assess differences in each domain score with additional characteristics, current position at work (staff or manager), and experience of a model Project (presence or absence).

We used PASW Statistics for Windows, version 18.0 (SPSS, Inc., Chicago, IL, USA) for data analysis.  $P < 0.05$  was considered statistically significant for all comparisons.

## **Results**

### **Participant characteristics**

The mean age of the participants was  $50.0 \pm 6.7$  years (range 31–60,  $n = 74$ ), mean length of their career as a PHN was  $25.5 \pm 7.6$  years (range 7–38,  $n = 74$ ), and mean length of experience providing individual support was  $17.4 \pm 8.2$  years (range 1–34,  $n = 73$ ). Among the 75 PHNs, 22 (29.3%) had experience with a model Project. As for position at work, 50 (66.7%) were staff nurses and 22 (29.3%) were managers.

### **Appropriateness of the model (Section 1)**

In the first section responses, 17 of the 20 mean scores (item-levels) were  $\geq 4$ , and the others were 3.92, 3.96, and 3.99. Thus, the data were accepted as adequate for analysis. For each item, at least 80% of the respondents answered 5 or 4 ("reflected well" or "almost reflected," respectively) (Table 3). Cronbach's alpha was 0.91 overall, and it was 0.82, 0.83, and 0.87 in basic, assessment, and support domains, respectively. In each domain, the mean domain score was higher than 80% of the highest range (Table 4).

Table 3. Frequency Distributions, Means, and Standard Deviations of 5-Point Likert Scale Questions (n = 75)

| Item number           | Point | Section 1 |        |      |     | Section 2 |        |             |     |
|-----------------------|-------|-----------|--------|------|-----|-----------|--------|-------------|-----|
|                       |       | n         | (%)    | Mean | SD  | n         | (%)    | Mean        | SD  |
| B1                    | 5     | 16        | (21.3) |      |     | 25        | (33.3) |             |     |
|                       | 4     | 52        | (69.3) |      |     | 41        | (54.7) |             |     |
|                       | 3     | 6         | (8.0)  |      |     | 6         | (8.0)  |             |     |
|                       | 2     | 1         | (1.3)  |      |     | 3         | (4.0)  |             |     |
|                       |       |           |        | 4.11 | .58 |           |        | 4.17        | .74 |
| B2                    | 5     | 19        | (28.0) |      |     | 25        | (33.3) |             |     |
|                       | 4     | 51        | (68.0) |      |     | 42        | (56.0) |             |     |
|                       | 3     | 4         | (5.3)  |      |     | 6         | (8.0)  |             |     |
|                       | 2     | 1         | (1.3)  |      |     | 2         | (2.7)  |             |     |
|                       |       |           |        | 4.17 | .57 |           |        | 4.20        | .70 |
| B3                    | 5     | 21        | (28.0) |      |     | 28        | (37.3) |             |     |
|                       | 4     | 47        | (62.7) |      |     | 35        | (46.7) |             |     |
|                       | 3     | 6         | (8.0)  |      |     | 9         | (12.0) |             |     |
|                       | 2     | 1         | (1.3)  |      |     | 3         | (4.0)  |             |     |
|                       |       |           |        | 4.17 | .62 |           |        | 4.17        | .80 |
| B4                    | 5     | 32        | (42.7) |      |     | 39        | (52.0) |             |     |
|                       | 4     | 41        | (54.7) |      |     | 34        | (45.3) |             |     |
|                       | 3     | 1         | (1.3)  |      |     | 2         | (2.7)  |             |     |
|                       | 2     | 1         | (1.3)  |      |     |           |        |             |     |
|                       |       |           |        | 4.39 | .59 |           |        | 4.49        | .55 |
| B5                    | 5     | 29        | (38.7) |      |     | 35        | (46.7) |             |     |
|                       | 4     | 43        | (57.3) |      |     | 34        | (45.3) |             |     |
|                       | 3     | 3         | (4.0)  |      |     | 6         | (8.0)  |             |     |
|                       |       |           |        | 4.35 | .56 |           |        | 4.39        | .63 |
| B6                    | 5     | 39        | (52.0) |      |     | 48        | (54.0) |             |     |
|                       | 4     | 35        | (46.7) |      |     | 26        | (34.7) |             |     |
|                       | 3     | 1         | (1.3)  |      |     | 1         | (1.3)  |             |     |
|                       |       |           |        | 4.51 | .53 |           |        | 4.63        | .51 |
| B7                    | 5     | 36        | (48.0) |      |     | 49        | (65.3) |             |     |
|                       | 4     | 38        | (50.7) |      |     | 24        | (32.0) |             |     |
|                       | 3     | 1         | (1.3)  |      |     | 2         | (2.7)  |             |     |
|                       |       |           |        | 4.47 | .53 |           |        | 4.63        | .54 |
| A1                    | 5     | 38        | (50.7) |      |     | 48        | (64.0) |             |     |
|                       | 4     | 32        | (42.7) |      |     | 27        | (36.0) |             |     |
|                       | 3     | 4         | (5.3)  |      |     |           |        |             |     |
|                       | 2     | 1         | (1.3)  |      |     |           |        |             |     |
|                       |       |           |        | 4.43 | .66 |           |        | 4.64        | .48 |
| A2                    | 5     | 21        | (28.0) |      |     | 24        | (32.0) |             |     |
|                       | 4     | 42        | (56.0) |      |     | 43        | (57.3) |             |     |
|                       | 3     | 10        | (13.3) |      |     | 8         | (10.7) |             |     |
|                       | 2     | 2         | (2.7)  |      |     |           |        |             |     |
|                       |       |           |        | 4.09 | .72 |           |        | 4.21        | .62 |
| A3                    | 5     | 11        | (14.7) |      |     | 17        | (22.7) |             |     |
|                       | 4     | 49        | (65.3) |      |     | 38        | (50.7) |             |     |
|                       | 3     | 13        | (17.3) |      |     | 19        | (25.3) |             |     |
|                       | 2     | 2         | (2.7)  |      |     | 1         | (1.9)  |             |     |
|                       |       |           |        | 3.92 | .65 |           |        | 3.95        | .73 |
| SD standard deviation |       |           |        |      |     |           |        | (continued) |     |

Table 3. (continued)

| Item<br>number | Point | Section 1 |        |      |     | Section 2 |        |      |     |
|----------------|-------|-----------|--------|------|-----|-----------|--------|------|-----|
|                |       | n         | (%)    | Mean | SD  | n         | (%)    | Mean | SD  |
| A4             | 5     | 14        | (18.7) |      |     | 19        | (25.3) |      |     |
|                | 4     | 47        | (62.7) |      |     | 41        | (54.7) |      |     |
|                | 3     | 13        | (17.3) |      |     | 13        | (17.3) |      |     |
|                | 2     | 1         | (1.3)  |      |     | 2         | (2.7)  |      |     |
|                |       |           |        | 3.99 | .65 |           |        | 4.03 | .74 |
| A5             | 5     | 13        | (17.3) |      |     | 18        | (24.0) |      |     |
|                | 4     | 47        | (62.7) |      |     | 40        | (53.3) |      |     |
|                | 3     | 14        | (18.7) |      |     | 14        | (18.7) |      |     |
|                | 2     | 1         | (1.3)  |      |     | 3         | (4.0)  |      |     |
|                |       |           |        | 3.96 | .65 |           |        | 3.97 | .77 |
| A6             | 5     | 28        | (37.3) |      |     | 36        | (48.0) |      |     |
|                | 4     | 41        | (54.7) |      |     | 36        | (48.0) |      |     |
|                | 3     | 6         | (8.0)  |      |     | 3         | (4.0)  |      |     |
|                |       |           |        | 4.29 | .61 |           |        | 4.44 | .58 |
| A7             | 5     | 34        | (45.3) |      |     | 48        | (64.0) |      |     |
|                | 4     | 34        | (45.3) |      |     | 27        | (36.0) |      |     |
|                | 3     | 5         | (6.7)  |      |     |           |        |      |     |
|                | 2     | 2         | (2.7)  |      |     |           |        |      |     |
|                |       |           |        | 4.33 | .72 |           |        | 4.64 | .48 |
| S1             | 5     | 14        | (18.7) |      |     | 22        | (29.3) |      |     |
|                | 4     | 57        | (76.0) |      |     | 46        | (61.3) |      |     |
|                | 3     | 4         | (5.3)  |      |     | 5         | (6.7)  |      |     |
|                | 2     |           |        |      |     | 2         | (2.7)  |      |     |
|                |       |           |        | 4.13 | .48 |           |        | 4.17 | .67 |
| S2             | 5     | 17        | (22.7) |      |     | 28        | (37.3) |      |     |
|                | 4     | 46        | (61.3) |      |     | 42        | (56.0) |      |     |
|                | 3     | 10        | (13.3) |      |     | 3         | (4.0)  |      |     |
|                | 2     | 2         | (2.7)  |      |     | 2         | (2.7)  |      |     |
|                |       |           |        | 4.04 | .69 |           |        | 4.28 | .67 |
| S3             | 5     | 19        | (25.3) |      |     | 25        | (33.3) |      |     |
|                | 4     | 48        | (64.0) |      |     | 39        | (52.0) |      |     |
|                | 3     | 8         | (10.7) |      |     | 9         | (12.0) |      |     |
|                | 2     |           |        |      |     | 2         | (2.7)  |      |     |
|                |       |           |        | 4.15 | .59 |           |        | 4.16 | .74 |
| S4             | 5     | 23        | (30.7) |      |     | 24        | (32.0) |      |     |
|                | 4     | 48        | (64.0) |      |     | 46        | (61.3) |      |     |
|                | 3     | 4         | (5.3)  |      |     | 4         | (5.3)  |      |     |
|                | 2     |           |        |      |     | 1         | (1.3)  |      |     |
|                |       |           |        | 4.25 | .55 |           |        | 4.24 | .61 |
| S5             | 5     | 24        | (32.0) |      |     | 29        | (38.7) |      |     |
|                | 4     | 45        | (60.0) |      |     | 39        | (52.0) |      |     |
|                | 3     | 5         | (6.7)  |      |     | 4         | (5.3)  |      |     |
|                | 2     | 1         | (1.3)  |      |     | 3         | (4.0)  |      |     |
|                |       |           |        | 4.23 | .63 |           |        | 4.25 | .74 |
| S6             | 5     | 19        | (25.3) |      |     | 21        | (28.0) |      |     |
|                | 4     | 43        | (57.3) |      |     | 39        | (52.0) |      |     |
|                | 3     | 11        | (14.7) |      |     | 8         | (10.7) |      |     |
|                | 2     | 2         | (2.7)  |      |     | 6         | (8.0)  |      |     |
|                | 1     |           |        |      |     | 1         | (1.3)  |      |     |
|                |       |           |        | 4.05 | .72 |           |        | 3.97 | .92 |

SD standard deviation

Table 4. Descriptive Statistics of Total Domain Score and Section Score (n = 75)

|            | Range of Possible Scores |      | Section 1  |        | Section 2  |        |
|------------|--------------------------|------|------------|--------|------------|--------|
|            | [number of items]        |      | M(SD)      | Range  | M(SD)      | Range  |
| Domain     |                          |      |            |        |            |        |
| Basic      | 7-35 <sup>a</sup>        | [7]  | 30.2 (2.8) | 22-35  | 30.7 (3.0) | 20-35  |
| Assessment | 7-35 <sup>a</sup>        | [7]  | 29.0 (3.3) | 17-35  | 29.9 (3.3) | 23-35  |
| Support    | 6-30 <sup>b</sup>        | [6]  | 24.9 (2.8) | 18-30  | 25.1 (3.6) | 12-30  |
| Total      | 20-100                   | [20] | 84.0 (7.4) | 67-100 | 85.6 (8.2) | 65-100 |

<sup>a</sup>80% of the highest range is 28.

<sup>b</sup>80% of the highest range is 24.

### Agreement with the ideas (Section 2)

In the second section responses, 17 of the 20 mean scores (item-levels) were  $\geq 4.0$ , and the others were 3.95, 3.97, and 3.97. Moreover, at each item, at least 80% of the respondents answered 5 or 4 (“strongly agree” or “agree,” respectively) (Table 3). Cronbach’s alpha was 0.91 overall, and it was 0.80, 0.85, and 0.90 for each domain. In each domain, the mean domain score was higher than 80% of the highest range (Table 4).

### Relation of Section 1 to 2

Spearman’s correlation coefficients between the items of Sections 1 and 2 indicated relatively strong correlations for items between the two sections (Table 5). Spearman’s  $\rho$ ’s between comparable items of the two sections varied from 0.42 to 0.75, and all were significant at the 0.01 level.

### Relationships between participant characteristics and section scores

In Section 1, the basic domain score showed weak negative correlations with age ( $\rho = -0.24$ ,  $p < 0.05$ ,  $n = 74$ ), length of PHN career ( $\rho = -0.25$ ,  $p < 0.05$ ,  $n = 74$ ), and length of experience providing individual support ( $\rho = -0.31$ ,  $p < 0.05$ ,  $n = 73$ ). A negative correlation was also found between the assessment domain score and length of experience providing individual support ( $\rho = -0.35$ ,  $p < 0.05$ ,  $n = 73$ ). No other significant correlations were found. ANOVA revealed that the groups with and without experience of a model project differed only in the basic domain score ( $F = 4.48$ ,  $p < 0.05$ ,  $n = 75$ ). PHNs in the group with experience scored higher than in the group without experience. As for the position at work (staff or manager), no significant difference was found in any domain.

In Section 2, there were no significant correlations between the basic characteristics of PHNs and domain scores. In addition, none of their other characteristics significantly differed in any of the domain scores.

Table 5. Correlations between Section 1 items and Section 2 items (n = 75)

| Item            | B1 <sup>a</sup> | B2 <sup>a</sup> | B3 <sup>a</sup> | B4 <sup>a</sup> | B5 <sup>a</sup> | B6 <sup>a</sup> | B7 <sup>a</sup> | A1 <sup>a</sup> | A2 <sup>a</sup> | A3 <sup>a</sup> | A4 <sup>a</sup> | A5 <sup>a</sup> | A6 <sup>a</sup> | A7 <sup>a</sup> | S1 <sup>a</sup> | S2 <sup>a</sup> | S3 <sup>a</sup> | S4 <sup>a</sup> | S5 <sup>a</sup> | S6 <sup>a</sup> |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| B1 <sup>b</sup> | .47**           | .26             | .14             | .27             | .24             | .34             | .33             | .23             | .36             | .18             | .35             | .12             | .25             | .28             | .13             | .10             | .04             | .13             | .19             | .07             |
| B2 <sup>b</sup> | .33**           | .47**           | .11             | .42**           | .25*            | .39**           | .38**           | .28*            | .17             | .15             | .19             | .05             | .22             | .18             | .22             | -.02            | .05             | .21             | .08             | .05             |
| B3 <sup>b</sup> | .22             | .24*            | .75**           | .37**           | .42**           | .23             | .27*            | .25*            | .30**           | .44**           | .41**           | .34**           | .23*            | .16             | .16             | .37**           | .16             | .38**           | .35**           | .33**           |
| B4 <sup>b</sup> | .22             | .37**           | .23*            | .68**           | .43**           | .50**           | .43**           | .31**           | .20             | .25*            | .21             | .15             | .35**           | .36**           | .20             | .08             | .14             | .29*            | .15             | .07             |
| B5 <sup>b</sup> | .25*            | .11             | .15             | .30**           | .67**           | .41**           | .37**           | .37**           | .21             | .29*            | .27*            | .25*            | .35**           | .23*            | .35**           | .18             | .24*            | .33**           | .24*            | .20             |
| B6 <sup>b</sup> | .16             | .36**           | .12             | .53**           | .46**           | .68**           | .55**           | .24*            | .13             | .23*            | .22             | .13             | .29*            | .32**           | .23*            | .13             | .14             | .18             | .09             | .13             |
| B7 <sup>b</sup> | .26             | .24*            | .31**           | .40**           | .38**           | .46**           | .66**           | .34**           | .25*            | .30**           | .27*            | .15             | .38**           | .31**           | .30**           | .29*            | .26*            | .21             | .30**           | .37**           |
| A1 <sup>b</sup> | .08             | .06             | .27*            | .09             | .21             | .27*            | .30**           | .42**           | .39**           | .24*            | .42**           | .29*            | .28*            | .17             | .27*            | .35**           | .33**           | .30**           | .34**           | .27*            |
| A2 <sup>b</sup> | .04             | .14             | .22             | .18             | .03             | .12             | .15             | .33**           | .61**           | .32**           | .55**           | .34**           | .40**           | .15             | .37**           | .39**           | .34**           | .53**           | .37**           | .30**           |
| A3 <sup>b</sup> | -.02            | .06             | .19             | .16             | .22             | .20             | .21             | .22             | .35**           | .58**           | .54**           | .37**           | .36**           | .21             | .14             | .22             | .27*            | .24*            | .21             | .37**           |
| A4 <sup>b</sup> | -.04            | .22             | .29*            | .25*            | .31**           | .24*            | .23*            | .32**           | .49**           | .55**           | .72**           | .44**           | .42**           | .28*            | .22             | .34**           | .33**           | .38**           | .32**           | .33**           |
| A5 <sup>b</sup> | .08             | -.18            | .12             | -.07            | .13             | .05             | .01             | .01             | .24*            | .36**           | .42**           | .56**           | .18             | .01             | .20             | .21             | .28*            | .30**           | .33**           | .31**           |
| A6 <sup>b</sup> | .04             | .06             | .06             | .25*            | .32**           | .30*            | .23*            | .35**           | .32**           | .25*            | .38**           | .26*            | .62**           | .40**           | .30**           | .22             | .37**           | .38**           | .27*            | .35**           |
| A7 <sup>b</sup> | .11             | .01             | .10             | .08             | .11             | .18             | .21             | .10             | .12             | .20             | .24*            | .28*            | .40**           | .46**           | .16             | .24*            | .17             | .17             | .18             | .17             |
| S1 <sup>b</sup> | .15             | .14             | .15             | .16             | .22             | .23*            | .23*            | .28*            | .36**           | .33**           | .45**           | .28*            | .30**           | .22             | .60**           | .46**           | .44**           | .43**           | .50**           | .38**           |
| S2 <sup>b</sup> | .10             | -.01            | .24*            | .10             | .33**           | .13             | .10             | .14             | .31**           | .44**           | .45**           | .33*            | .31**           | .17             | .23*            | .43**           | .40**           | .46**           | .41**           | .52**           |
| S3 <sup>b</sup> | .15             | .11             | .16             | .25*            | .38**           | .30**           | .24*            | .34**           | .48**           | .38**           | .54**           | .46**           | .46**           | .29*            | .38*            | .41**           | .62**           | .64**           | .46**           | .39**           |
| S4 <sup>b</sup> | .12             | .08             | .27*            | .27*            | .32**           | .36**           | .26*            | .23*            | .44**           | .35**           | .53**           | .41**           | .36**           | .16             | .46**           | .50**           | .54**           | .68**           | .52**           | .39**           |
| S5 <sup>b</sup> | .26*            | .17             | .41**           | .23*            | .28*            | .25*            | .29*            | .32**           | .27*            | .24*            | .38**           | .24*            | .30**           | .28*            | .54**           | .55**           | .45**           | .48**           | .64**           | .44**           |
| S6 <sup>b</sup> | .31**           | .07             | .33**           | .12             | .32**           | .28*            | .33**           | .32**           | .23*            | .33**           | .39**           | .38**           | .31**           | .28*            | .45**           | .36**           | .37**           | .36**           | .43**           | .58**           |

\* p &lt; 0.05, \*\*p &lt; 0.01.

<sup>a</sup>Section 2 item. <sup>b</sup>Section 1 item.

## Discussion

The participants agreed that the ideas of the NSM were consistent with the support they offered to people with mental illness and agreed that the concept of the Adapted Support Model reflected these ideas. This was shown by the appropriateness and agreement scores of more than 80% on both points, suggesting that the Adapted Support Model appropriately represented their concepts of individual support to people with mental illness. In addition, the relatively strong relationship between the same items in Sections 1 and 2 showed that the participants who agreed with an idea could easily recognize it in the Adapted Support Model. This suggested that those who had previous experience were able to grasp the implications of the Adapted Support Model.

In the evaluation of the Adapted Support Model, weak negative correlations were observed between section scores and variables such as age, length of PHN career, and length of experience providing individual support in the basic and assessment domains. According to Benner<sup>11)</sup>, “the expert performer no longer relies on analytic principle (rule, guideline, maxim),” and “with enormous background of experience, now has an intuitive grasp of each situation...,” which indicates that the more the years of experience, the more one will rely on one’s own intuition. The negative correlations may reflect this tendency among expert PHNs.

Furthermore, those who had experience of a model Project showed a better grasp of the concepts in the Adapted Support Model than those with no experience (higher scores in the basic domain of Section 1). This suggests that experience of a model Project improved the likelihood of a PHN understanding the model. Further survey on PHNs’ ideas about model utilization could add to our understanding of these relationships.

We set the inclusion criteria as expert PHNs with more than 7 years of experience in providing individual support to people with mental illness. However, some PHCs included participants who did not meet our criterion of being an expert but had more than 8 years of experience. This on-site judgment suggests that PHNs at an expert level of community nursing can primarily fulfill their roles in all fields, including community mental health. Moreover, as indicated by Benner<sup>11)</sup>, this may apply regardless of their specialism if they have over 5 years of experience.

This study provides details of a preliminary stage in the development of a support model for people with mental illness. However, because any model is only abstract in nature, we assessed only its principles in this study. The result shows that we can proceed with the draft model and that there is a need to further assess its elements in a community setting. Indeed, the feasibility of the model has not yet been considered. On-site community studies should be conducted to complete the

adaptation of the model for practical use.

### **Study limitations**

First, the results reported here are from a small number of expert PHNs in Japan ( $n = 75$ ). The tight inclusion criterion limited the sample. Furthermore, the requirement for proceeding the subsequent questions; PHNs had to read and understand the theoretical framework and concepts carefully, which was daunting for them. The model, therefore, probably does not represent the ideas of all expert PHNs in Japan, and the findings of the study must be thus cautiously interpreted.

Second, we targeted only PHNs working in PHCs. Although these are the first-line public institutions for providing mental health support, we excluded nurses working in community health centers, which also provide mental health services. PHNs in community health centers could have different demographics and roles, thereby influencing their perception of the model. This limits the generalizability of our data.

The third limitation might be a response bias. The questions were basically extracted from the existing model, so it is possible to have led participants' opinions. The response bias could, in turn, have led to an overestimation of the model. Further research is needed to clarify this issue.

### **Conclusions**

In this study, we focused on the roles and ideas of the PHNs who had experience of offering individual support to people with mental illness. Most of them supported the appropriateness of the Adapted Support Model and agreed with the ideas of this model. The results from this study indicates that NSM can contribute to improve PHNs' roles and ideas for supporting people with mental illness in community settings in Japan. There is a need for further studies to improve this Adapted Support Model for more practical use.

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