Competencies required for occupational health nurses

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Abstract: Objectives: For occupational health (OH) nurses to perform activities effectively, not only skills and knowledge but also competencies proposed by Dr. McClelland are indispensable. This study aimed to identify competencies required for OH nurses and to show their structure diagram. Methods: Qualitative descriptive research was conducted from October 2010 to August 2011. Eight high-performing OH nurses participated, and data were collected from semi-structured interviews held for each nurse. Data were qualitatively and inductively analyzed using the KJ method. Results: Seven competencies were identified: “self-growth competency,” “OH nursing essence perpetuation competency,” “strategic planning and duty fulfillment competency,” “coordination competency,” “client growth support competency,” “team empowerment competency,” and “creative competency.” A structure diagram of the seven competencies was clarified. As the definitions of the competencies were different, the findings of competencies for OH nursing in the United States of America (USA) could not simply be compared with the findings of our study; however, all seven competencies were compatible with those in AAOHN model 1 and AAOHN model 2 in the USA. Conclusion: Our seven competencies are essential for OH nurses to perform activities that meet the expectations of employees and the employer. (J Occup Health 2017; 59: 562-571) doi: 10.1539/joh.16-0188-OA

Key words: Competency, Occupational health nurse, Occupational health nursing
Based on the above, the competencies required for OH nurses that we defined and their structure diagram were not clarified. Thus, this study aimed to identify the competencies proposed by Dr. David C. McClelland and to show the structure diagram.

Subjects and Methods

Research design

A qualitative descriptive research method was used to grasp “the way of thinking about things,” “attitude to work,” “sense of persistency,” and “behavioral characteristic” of participants in a straightforward manner.

Participants

Participants were 8 OH nurses who had more than 10 years of experience in OH nursing activities in the workplace, who met the conditions of high performers, and who satisfied with the following three points: being a member of the Japan Society for OH, reporting superior practices in an OH-related academic journal or annual meeting, and having led an OH nursing team in a business organization. The characteristics of the participants are shown in Table 1.

Data collection

Data were collected from semi-structured interviews conducted between October 2010 and August 2011. Interviews with the participants were individually conducted according to an interview guide (Box 1). The interview guide was made based on seven fields that were considered to be the fabric of competency. They included “self,” “interpersonal,” “product,” “strategy,” “thinking,” “information,” and “time.” Each interview session ranged from 60 min to 90 min. A digital voice recorder was used only when the participants provided consent.

Data analysis

Analysis was conducted by including all seven items in the interview guide (Box 1). Data were qualitatively and inductively analyzed using the KJ method, which was developed by the Japanese ethnologist Dr. Kawakita J. Procedures for analysis are shown in Fig. 1 First, segmentation was conducted. Second, the competencies were categorized into seven fields. Third, the segmented contents of high performers were extracted. Fourth, the extracted competencies were arranged side by side in each field. Finally, the competencies were summarized into comprehensive statements that represented the overall characteristics of all participants.

Table 1. Characteristics of participants

| Participant Number | Gender | Age (Years) | Experience of OH nursing (Years) | Category of organization | Type of company | Number of employee |
|--------------------|--------|-------------|---------------------------------|--------------------------|-----------------|-------------------|
| 1                  | Female | 40’s        | 20                              | Company                  | Manufacturing   | about 5,800       |
| 2                  | Female | 40’s        | 20                              | Company                  | Manufacturing   | about 2,100       |
| 3                  | Female | 40’s        | 26                              | Company                  | Manufacturing   | about 8,000       |
| 4                  | Female | 40’s        | 20                              | Company                  | Chemical        | about 2,500       |
| 5                  | Female | 40’s        | 16                              | Company                  | Communications  | about 62,000      |
| 6                  | Female | 40’s        | 22                              | Company                  | Services        | about 6,500       |
| 7                  | Female | 50’s        | 21                              | Company                  | Manufacturing   | about 11,000      |
| 8                  | Female | 60’s        | 35                              | Company                  | Manufacturing   | about 2,400       |
ond, organization and naming based on similarity were performed, and first group competencies were abstracted. Third, by repeated group organization and naming, further abstraction was conducted until saturation, and second group, under sub, sub, and core competencies were created. Fourth, relationships among core competencies were identified.

Every time a participant’s interview ended, we moved on to segmentation, and we judged that a new segment was not obtained any more in the time the eighth participant’s interview ended.

**Box1  Interview guide**
Concrete contents are the following talks from the seven fields about what activities you value as an OH nurse.

1. **Self:** What kind of efforts are you taking about self-reform for achieving responsibility in your role as an OH nurse?
2. **Interpersonal:** How do you act when you want to make your personal relationship better with your employer and employees?
3. **Product:** What kind of efforts are you taking to obtain excellent results and to improve OH nursing activities?
4. **Strategy:** Please tell me the strategy of OH nursing activities that you follow for better practice or performance.
5. **Thinking:** What do you think when you convey your thought/belief to the employer/employees and solve complicated problems?
6. **Information:** How do you devise your own ideas when you collect, utilize, share, and send the information needed for OH nursing activities?
7. **Time:** What kind of time management system do you follow to make your work or your team member’s work efficient?

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**Ethical considerations**
Participants were informed of the study’s purpose and method by both orally and through a document that was distributed at the time the participants were called for the interview, and each participant provided approval at the interview. They were informed that participation in the study was voluntary and that they could refuse to participate in or withdraw from the study at any time. Data identifying individuals were corded and anonymized. This study was conducted after obtaining approval from the research ethics committee of Yokkaichi Nursing and Medical Care University, Yokkaichi, Japan (Approval number 42).

**Results**

**Core, Sub, and Under sub competencies**
According to the procedures of the analysis, 741 segments were extracted. During data integration, 303 segments as the first group and 101 as the second group were abstracted, and 40 under sub competencies, 14 sub competencies and 7 core competencies were identified (Table 2).

The seven core competencies were as follows: “self-growth competency,” “OH nursing essence perpetuation competency,” “strategic planning and duty fulfillment competency,” “OH nursing competence,” “person-centered competency,” “OH nursing development competency,” and “OH nursing evaluation competency.”

| Table 2. Results of analysis |
|-----------------------------|
| Segments                    | 714 |
| 1st group                   | 303 |
| 2nd group                   | 101 |
| Under sub competencies      | 40  |
| Sub competencies            | 14  |
| Core Competencies           | 7   |

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**Fig. 1. Procedure for analysis**

![Diagram of analysis process](image-url)
Each core competency had 1-3 sub competencies. “Self-growth competency” had one sub competency. It was to promote the self-reforestation of OH nurses by incorporating various methods and ideas. “OH nursing essence perpetuation competency” consisted of two sub competencies. One of them was to have a perspective on the management of the organization. The other was to have consciousness as professionals, understand the essence of OH nursing, and perform the roles and functions of an OH nurse. There were three sub competencies under “strategic planning and duty fulfillment competency.” One of them was that OH nurses improved awareness of their roles among the employer and employees. The second one was that OH nurses conducted their duties by various methods such as gathering information, analysis, and time management. The third one was that OH nurses repeated work steadily, setting milestones, thinking “Plan, Do, Check, Act” and standing on a long range perspective for goal achievement. “Coordination competency” had three sub competencies. The first one was to form stable and cooperative relationships. The second one was to match the vector by adjusting to interpersonal, departmental and interorganizational differences. The third one was to assess the person, the place, and the timing to solve problems. “Client growth support competency” had two sub competencies. One of them was to respect clients’ thoughts and to flexibly care for clients’ needs. The other was to affect clients and to support clients’ growth, so that the clients could improve their quality of life (QOL) and become independent. “Team empowerment competency” had one sub competency. It was to share a role according to the ability of member and improve team power. “Creative competency” consisted of two sub competencies. One of them was to create new systems, organizations and roles for the development of OH nursing. The other was to raise the social evaluation and establish the expertise of OH nurses through activities and research in academic societies.

All 40 under sub competencies are shown in Table 3.

Structure diagram

The relationships among the seven competencies that were identified in this study are shown by an arrow.

“Self-growth competency” was related to the six other competencies, and “OH nursing essence perpetuation competency” was related to “strategic planning and duty fulfillment competency,” “coordination competency,” “client growth support competency,” and “team empowerment competency” as an important core of OH nursing activities. The activities by these four competencies provided substantial health support and led to “creative competency,” which was necessary for further improving OH nursing activities.

Discussion

Core competencies

We would like to compare our findings with competencies in public health nursing and competencies in hospital nursing to clarify the characteristics of OH nursing. However, studies on competencies in public health nursing were conducted for specific items, such as competencies concerning the creation of project and social resources, competencies in the development of educational program, and competencies in specific health guidance and for people of specific object such as middle level public health nurses who were practicing positively in community; thus, we considered that it was unreasonable to compare the findings of those studies with our findings. There are many studies on competencies in hospital nursing, but the competencies developed by Nakayama et al. (Nakayama model) were good if we compared them with our findings because that model showed competencies in hospital nursing for all items and not for specific items. A systematic study on competencies required for OH nurses in Japan was not found.

Therefore, we decided to compare our findings with the Nakayama model and the competencies developed by the American Association of OH Nurses in 2007 (AAOHN model 1) and 2015 (AAOHN model 2), which are the competencies of OH nurses.

The role of OH nurses is to support the employer and employees based on the principle of nursing (Box 2) as a member of an interdisciplinary team comprising various OH professionals such as an OH physician, OH nurse, industrial hygienist and health officer so that the employer can independently achieve the purpose of OH (Box 3) in cooperation with the employees. To fulfill the role of OH nurses, it is expected that they should be aware about raising the productivity of the organization and perform their activities in accordance with their nursing specialty. Therefore we extracted “OH nursing essence perpetuation competency” from the analysis. This competency was not included in the Nakayama model. In terms of OH nursing competencies in AAOHN model 1 and AAOHN model 2, we cannot simply compare them with the results of our study because the definition of competency is different. However, we consider that this competency is expressed in both AAOHN model 1 and AAOHN model 2 as the basis of OH nursing. Therefore “OH nursing essence perpetuation competency” shows the specialty of OH nursing.

Four competencies, i.e., “strategic planning and duty fulfillment competency,” “coordination competency,” “client growth support competency,” and “team empowerment competency” were extracted. As previously noted in the role of OH nurses, OH nurse systematically sup-
### Table 3. Core, Sub, Under sub competencies

| Core | Sub | Under sub |
|------|-----|-----------|
|      |     |           |

#### Self-growth competency

- OH nurses promote their self-reform by incorporating various methods and ideas
  - Learning from colleagues, seniors, documents and existing systems
  - Studying it by themselves actively
  - Looking back on their nursing activities and thinking about their stances as OH nurses
  - Interpreting difficulties positively
  - Having an attitude aiming at the improvement of OH nursing

#### OH nursing essence perpetuation competency

- OH nurses have a perspective on the management of the organization
  - Acting in conformity with the objectives of the organization
  - Acting in conformity with the management philosophy and policy of the organization

- OH nurses have consciousness as professionals, understand the essence of OH nursing, and perform the roles of an OH nurse
  - Thinking in conformity with the principles of OH nursing
  - Being able to see the essence of things not just the outward appearances
  - Achieving the roles and functions of OH nurse with consciousness as professionals

#### Strategic planning and duty fulfillment competency

- OH nurses improve awareness of their roles among the employer and employees
  - Informing the employer and employees of the specialty and roles of OH nurses

- OH nurses conduct their duties by various methods such as gathering information, analysis, and time management
  - Gathering necessary information by various methods
  - Improving efficiency of the work by cooperating with the people concerned
  - Reordering and analyzing the sources of confusion
  - Being aware of efficiency and effectiveness
  - Thinking about an efficient method for accomplishing duties

- OH nurses repeat work steadily, setting milestones, thinking Plan, Do, Check, Act and standing on a long range perspective for goal achievement
  - Repeating work steadily patiently and connecting it to the next action
  - Acting, setting milestones and exploiting Plan, Do, Check, Act
  - Working with a long-term view
  - Acting with a wide view, so that OH nurse’s viewpoint is not partial

#### Coordination competency

- OH nurses form stable and cooperative relationships
  - Building and maintaining human relations while devising
  - Valuing human relationships and contacting clients

- OH nurses match the vector by adjusting to interpersonal, interdepartmental and interorganizational differences
  - Adjusting opinions among people, departments and teams and making sure that each can play the role

- OH nurses assess the person, the place and the timing to solve problems
  - Getting client’s understanding by various ways and persuading him or her for problem solving
  - Ascertaining a key person and working on him or her
  - Working with a choice of the appropriate time and place
Table 3. (continued)

| Core | Sub   | Under sub                          |
|------|-------|------------------------------------|

### Client growth support competency

- **OH nurses respect clients’ thoughts and flexibly care for clients’ needs**
  - Respecting client’s thought and the sense of values, and flexibly working on him or her
  - Changing the way to work according to the situation of the client
  - Working on clients to feel that OH nurses are helpful to them
  - Responding flexibly according to the changes in the situation of the client
  - Making the opportunities to go to the workplace intentionally

- **OH nurses affect clients and support clients’ growth, so that the clients can improve their QOL (Quality of Life) and become independent**
  - Supporting to improve the QOL of client
  - Supporting to have the independence that clients, departments and organizations can notice and solve the problems by themselves
  - Supporting to make the workplace mature and productive through problem solving

### Team empowerment competency

- **OH nurses share a role according to the ability of member and improve team power**
  - Sharing roles according to members’ abilities
  - Sharing information and experiences among team members and fitting their vectors

### Creative competency

- **OH nurses create new systems, organizations and roles for the development of OH nursing**
  - Creating new OH systems, so that OH nurses can effectively conduct their activities
  - Creating OH nurse’s roles in the organization

- **OH nurses raise the social evaluation and establish the expertise of OH nurses through activities and research in academic societies**
  - Developing skills and programs useful for OH nurse’s activities
  - Performing the activities in academic societies for OH, OH nursing and nursing except OH nursing, and enhancing the social evaluation of OH nurses

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**Fig. 2.** Structure diagram
ports the individual, group, and organization based on the principle of nursing as a member of the professional team in OH for the employer and employees so that the employer can independently achieve the OH in cooperation with employees. Therefore “client growth support competency” and “team empowerment competency” are important to fulfill the role of OH nurses. “Client growth support competency” was not included in the Nakayama model. The reason for this may be that nurses in hospitals focuses on the patient’s disease itself. We consider that “OH nurse assumes OH nursing leadership role in business, academia, government, and the community” in AAOHN model 1 and “OH nurse educates, counsels, and coaches the client on identifying, reducing, and eliminating health and safety risks” in AAOHN model 2 may have the same meaning as “client growth support competency.” “Team empowerment competency” was not shown in the Nakayama model. We consider that the reason is the same as what was described in “client growth support competency.” There are no similar competencies in AAOHN model 2. However, in AAOHN model 1, we consider that there is an aspect that the competency of “OH nurse fosters collaborative practice as a member of the interdisciplinary team with emphasis on OH and safety areas” connects with “team empowerment competency.” Even if it is the company’s primary objective is to improve productivity and the importance of health is recognized, effective activities of OH nurses cannot be performed without “strategic planning and duty fulfillment competency” and “coordination competency.” Thus, these two competencies are also indispensable. “Strategic planning and duty fulfillment competency” was not indicated in the Nakayama model, but in AAOHN model 1 and model 2, “attitude to work” and “behavioral characteristic” concerning this competency were shown in “OH nurse assumes OH nursing leadership role in business, academia, government, and the community” and “OH nurse demonstrates effective skills in planning, financial management, organizing, staffing, directing, and evaluating health, safety, and environmental programs and services with corporate culture, business objectives, and population needs” in AAOHN model 1 and were shown in “OH nurse plans, implements, and evaluates programs and services designed to improve health and safety for target populations,” “OH nurse demonstrates current knowledge of and compliance with applicable laws and regulations that impact nursing practice, workers, workplaces, and the environment,” “OH nurse advises employees of regulations that may affect occupational and environmental health operations,” “OH nurse describes the broad impact of economics on a target population’s health and well-being,” and “OH nurse communicates the direct and indirect consequences of injury and illness on worker productivity, employee engagement, and QOL” in AAOHN model 2. We consider that competencies shown in the two AAOHN models, which are not shown in the Nakayama model, represent the characteristics of OH nursing. In the Nakayama model, “coordination competency” was shown as “capability to adjust the care environment and team structure”, but was not directly described, and was expressed in some competencies in AAOHN model 1 and was shown in “OH nurse coordinates client care to effectively promote health, manage illness and injury, prevent disability, and facilitate return to work” in AAOHN model 2. Therefore, we consider that this competency is necessary for hospital nursing and OH nursing.

To further improve the effect of activities of OH nurses, new systems/organizations for the roles and activities of OH nurses should be created, and academic society activities and research activities should be active. For these reasons, “creative competency” is considered to be an important competency for future development. In the Nakayama model, this competency was described as “improvement of the specialty and improvement of the quality,” and in AAOHN model 1, it was included in the two competencies: “OH nurse identifies need for and participates in research activities, analyzes and interprets data, and applies new knowledge to practice issues or problems” and “OH nurse pursues ongoing and lifelong professional development and develops advanced OH nursing skills to improve professionalism in OH and safety.” In AAOHN model 2, the competency was shown in “OH nurse uses data to plan and implement evidence-based OH programs, services, and new initiatives and to evaluate them for both health and economic impact.” Accordingly, we consider that “creative competency” has an important position for nurses, even if the specialized fields of nursing are different.

“Self-growth competency” is essential for improving professionalism in OH nursing. This competency was indicated as “continuing learning” in the Nakayama model. In AAOHN model 1, this competency could not be named as the independent competency, but in AAOHN...
model 2, it was shown in "OH nurse demonstrates professional competence and lifelong learning throughout career" and "OH nurse critically reviews relevant literature and other credible resources to develop evidence-based interventions and OH nursing strategies." For these reasons, we consider that "self-growth competency" is necessary for hospital nursing and OH nursing.

Based on the above information, among the seven competencies, "OH nursing essence perpetuation competency," "strategic planning and duty fulfillment competency," "client growth support competency," and "team empowerment competency" were shown in the AAOHN model; however, these were not provided in the Nakayama model. Therefore, these four competencies were considered to be competencies representing the expertise of OH nursing. On the other hand, as "creative competency," "coordination competency," and "self-growth competency" were shown in the Nakayama model and AAOHN model, they were considered to be necessary in hospital nursing and OH nursing.

Structure diagram
We discussed the relationships among the seven competencies identified in this study.

For OH nurses to respond to the needs of the employer and employees which have been diversifying with the change of the times, "self-growth competency" is indispensable as the competency that becomes most basic of OH nursing activity; therefore, this competency was placed as the base of all competencies. "OH nursing essence perpetuation competency" is a capability important to show OH nursing. A high performer understands "what is important and what is not important" for achieving good results. In this study, high performers among OH nurses understood that it was important to perpetuate the essence of OH nursing in their activities. For these reasons, this competency was placed as a foundation of the following four competencies: "strategic planning and duty fulfillment competency," "coordination competency," "client growth support competency," and "team empowerment competency." "Strategic planning and duty fulfillment competency" is important to solve OH problems adding to complexity and to perform a cost-effective activity. In addition, "coordination competency" and "team empowerment competency" are necessary for efficiency because OH activities are pushed forward by a team comprising various professionals. To increase the independence of the client is an important role of an OH nurse; and as already described, the role of OH nurses is to support the employer and employees so that the employer can independently achieve the purpose of OH in cooperation with employees, therefore "client growth support competency" is also essential. For these reasons, the four competencies were placed in the center. Regarding OH nursing activities, there is still a big gap between the present conditions and the ideal situation. In the future, "creative competency" is an essential competency to bring the present conditions close to the ideal situation; for this reason, this competency was placed in the top line.

Based on the above, "OH nursing essence perpetuation competency" was cultivated by continuing to have "self-growth competency" as OH nurses with high competencies, and high performers among OH nurses were supported by them; it was considered that the practice was active with "strategic planning and duty fulfillment competency," "coordination competency," "client growth support competency," and "team empowerment competency." "Creative competency" was necessary to bring the practice more close to the ideal situation.

Limitation of this study
This study is considered to have a bias in terms of the study population.

We judged that information to be required reached the saturation when we finished the segmentation of the eighth participant, but reconsideration is required about whether this was enough.

Furthermore, the purpose of this study was to identify the competencies proposed by Dr. David C. McClelland and not to clarify the activities of high performers among OH nurses. Therefore, we did not select participants in consideration of the affiliation, type of business, and size of the organization. However, the consideration might be necessary about these in the selection of participants because positive evidence that these backgrounds do not affect the competencies of OH nurses was not provided.

Conclusion
For OH nurses to perform activities that meet the expectations of the employer and employees, seven essential core competencies were identified, and we related them on the structure diagram.

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