



## Research Article

# The Process of Structuring Community Health Needs by Public Health Nurses Through Daily Practice: A Modified Grounded Theory Study

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## ABSTRACT

**Purpose:** It is extremely difficult to apply the model learned in basic education for public health nurses (PHNs) to conduct community health assessments. The purpose of this study was to clarify the process by which community health needs can be structured through PHNs' daily practice.

**Methods:** Semistructured interviews were conducted in 29 PHNs, and continuous comparative analysis using a qualitative study was performed with a modified grounded theory approach.

**Results:** The participants "used their five senses to understand the relationship between the health and life of people" and "considered those who do not attend" by "learning from stakeholders." To verify such subjective feelings sourced from vague phenomena within the communities, subjective phenomena were converted into qualitative data.

**Conclusion:** The application of the findings to organizational continuous education systems may not only help appropriately improve community health assessment methods but can also help improve the evaluation of daily practice and contribute to professional human-resource development.

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## Introduction

In Japan, more than 70% of public health nurses (PHNs) are employed by administrative agencies [1]. The main role of PHNs as civil servants is in working to promote health and disease prevention for local residents. However, in basic PHN training, several factors make it difficult to maintain the quality of education: the difficulty of securing training facilities and clinical instructors for nurses (as a result of the rapid increase in nursing colleges), the difficulty of securing faculty members with high levels of practice and teaching competencies [2], and the diversity of educational institutions and education systems for PHNs [3]; all of these have been listed as obstacles to maintaining the quality of PHN education. The number of nursing universities in Japan has increased dramatically from 11 universities in 1991 to 263 universities in 2018 [2]. Furthermore, an amendment regarding the designation of regulations for health nurse educational training from the Ministry of Health, Labour and Welfare and a curriculum amendment from

the Ministry of Education, Culture, Sports, Science and Technology have led to major changes in the education system for PHNs, meaning that while more than 80% of nursing universities could obtain both a nurse's license and a PHN's license in 2011, 80% and more of nursing universities have changed to a curriculum which limits the number of students who can obtain a PHN's license in 2012 [2].

Recently, as one possible solution to the aforementioned obstacles, medical education based on practice competencies has attracted attention and has been recommended based on its educational and clinical benefits, its associated promotion of student-oriented curricula, and its educational accountability [4]. Supporting this idea, a variety of findings regarding the development of education programs and practices, based on the expected practice competencies for PHN education, have been reported [5–7]. Among such competencies, the skill regarding performing population-based community health assessments is one of PHNs' unique abilities and can serve as the basis for the development of effective public health nursing to address community-specific health problems. With regard to specific education methods used to teach this skill, many educational institutions have established the skill as part of a theoretical framework (e.g., the community-as-partner model, the precede-proceed model) [8,9] of their training and practice to help nurses recognize means of systematically

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understanding community characteristics and health needs. The more the experience students have in practice and training, the higher their self-assessment when completing community health assessments [10,11].

On the other hand, the size of many communities that PHNs are responsible for managing in local governments (i.e., municipal PHNs) expanded after municipal mergers during the 2000s. Therefore, many municipal PHNs cannot use the quantitative data they have accumulated to analyze annual changes in the manner that had previously been done. Data collection became a priority as PHNs became overwhelmed with case treatment, as their administrations are also responsible for providing urgent care for people with multiple complicated health needs. However, education for PHNs should exist to develop public health nursing activities that clarify and solve community health problems. A similar problem has been reported among PHNs in Norway. Although the governments expect them to focus on primary prevention and health promotion, they spend considerable time and effort, despite a limited amount of daily practice time, supporting high-risk patients [12]. To meet such social expectations, it is important to clarify the role of PHNs as “expert generalists” who can elucidate the characteristics/needs of their districts. This may lead to a better professional identity as PHNs and eventually to the promotion of diverse and complex collaboration and an increase in the economic value of health-care policies [12].

Thus, it would be extremely difficult for PHNs in clinical practice to conduct community health assessments by using the systematic theoretical model they studied during basic education, as they must also engage in daily practice that prioritizes support for high-risk patients. However, if municipal PHNs cannot identify the community health needs in their charge area, their community will be unable to understand the health problems that are specific to that community and then develop activities to address these problems. In other words, in such a situation, municipal PHNs' roles will not be worthwhile. Based on this background, the present study focused on the following question: How do PHNs realize if they are clearly identifying health problems in their daily practice? Considering this question, the purpose of this study was to clarify the process by which municipal PHNs do this while also fulfilling their daily practice requirements.

## Methods

### Study design

This study used a modified grounded theory approach (M-GTA) [13], which is a modified version of the grounded theory approach designed by Glaser and Strauss [14]. The M-GTA and the grounded theory approach share the same basic characteristics: theory generation that is grounded in data, empiricism, deep interpretations, and verification by application.

However, there are two primary differences between the two approaches that highlight the strengths of the M-GTA. First, in the M-GTA, all pieces of recorded interview data are analyzed according to an analytic theme based on the viewpoints of an “analytical focused person.” It is established because it helps clarify the focus of the analysis, which then fits within a certain range of human actions, recognitions, emotions, and influencing factors. In addition, individuals in the audience can apply the knowledge in actual settings based on its viewpoints [13,15]. Second, the method of strict coding procedures using Strauss's [16] position that data should be broken down into small chunks, labeled, and coded was not used. The data interpretations on an analysis worksheet would enable the direct formation of concepts through the coding

procedures of the M-GTA; a fine fragmentation would simply narrow the context of participants' statements or actions [13,15].

### Settings and participants

Municipal PHNs who had been in charge of their districts for long periods were included in this study. Specifically, as the participants were required to talk about their practice, only those with more than three years of practice experience were recruited [17]. PHNs who had a long career might have more practical and rich experience than those with shorter careers. However, in the course of data analysis and collection, some additional selection requirements other than PHN experience years arose in the sampling. For example, one PHN stated that “it is important that know the actual conditions of people living in the bottom levels of society.” This statement illustrates that PHNs belonging to the welfare department might have changed how they approached the issue of community health needs as compared with PHNs belonging only to health departments for disease prevention or health promotion. Similarly, theoretical sampling was carried out to place PHNs on position, marital status, and educational background, while comparing each concept extracted during the process of data analysis. Twenty-nine PHNs were selected as participants by using theoretical sampling.

However, the sampling was limited by the fact that data were only collected in two municipalities. One was a small municipality with a population of about 15,000 in the Chubu Region (in the top 60% of Japanese municipalities with regard to size), and the other municipality was a medium-sized municipality with a population of about 80,000 in the Kansai Region (in the top 20% of Japanese municipalities with regard to size). Both municipalities have common community characteristics where the younger generation includes comparatively large numbers of migrants, and there are regions with elderly households that have been in the area for a long time.

### Data collection

The participants completed semistructured interviews from April to October 2011. In the interview, participants were asked the following main questions: “What do you consider to be ‘community health needs?’” and “In what situations do you feel that you are taking care of ‘community health needs?’” To protect their privacy, a secure private room in their workplace, whenever possible, was used for the interviews. In cases where the participants were called to an emergency, the interview was halted and postponed to another time or day. After obtaining the participants' permission, their responses were recorded on a digital voice recorder and later digitized and recorded verbatim. Field notes were taken for use as a reference for the participants' facial expressions and behaviors during the interviews.

### Data analysis

The PHNs' processes of structuring community health needs were analyzed using the M-GTA. All participants were municipal PHNs, and the “analytical focused person” in this study is a PHN who is employed by a municipal administrative agency. The data analysis focused on its viewpoints and perceived meanings, particularly examining identifying behaviors and ideas that seemed to reflect community health needs and related background factors.

The details of the analysis procedure of the M-GTA are as follows:

- (1) In open coding, all written responses or recorded interviews are transcribed verbatim. Sentences that seem to have similar patterns are collected and given a concept name. The analytical worksheet consisted of four columns: (i) variation (a chunk of meaningful text extracted from the raw data and used as a concrete example); (ii) theoretical notes (questions and ideas noted during the analysis as theories to remember and to be used as thought logs); (iii) the definition of the concept (definitions that logically clarify the interpretation of the data); and (iv) the concept name. Then, each concept was formed directly from interpretations of data on an analysis worksheet. In other words, open coding results in concept formation. The researchers did not use the method of finely fragmenting data (e.g., coding data line by line) as supported by Strauss [16] but formed concepts directly from interpretations of data on an analysis worksheet.
- (2) Similar and opposite examples were interpreted based on the definition of each concept. The concepts and the definitions of the concepts were modified to fit the variations, as necessary. Care was taken to minimize the semantic differences between the variations and concepts. In addition, to avoid arbitrary researcher biases, the maximum range of the phenomena was examined by using both similar and opposite examples.
- (3) For each level (i.e., the level at which concepts are created from variations, the level at which categories are created by comparisons between concepts, and the level at which overall central categories are created by comparisons between categories), a simultaneous multiple parallel analysis was performed both cross-sectionally and longitudinally. In particular, when increasing levels of abstraction, the different levels of abstraction were compared and converged, and the contexts and interpretation contents were consistently checked according to the grounded-in-data principle. In other words, in selective coding, several concepts were integrated into one category and several categories were integrated into one core category.
- (4) A diagram with descriptions of the relationships among concepts, categories, and core categories was developed according to the results. The storyline, which was a narrative theme with the words of concepts, categories, and core categories, was then presented.
- (5) Three PHNs and three researchers who were well experienced with community health needs reviewed the results and stated that the results were analogous to their experience (applicability, transferability). After analyzing the 29th interview, no more changes were needed for major concepts and categories, and the data collection and analyses were concluded. Then, this research reached theoretical saturation.
- (6) Regarding the readiness of the data analyst, the author has 9 years of practical experience with a local government and 17 years of teaching experience in public health nursing and is familiar with the study topic. In addition, after engaging in qualitative research in a master's degree program, the research has been involved in self-improvement through participation in workshops.

### Rigor

Four criteria (credibility, dependability, confirmability, and transferability) are used to evaluate trustworthiness or rigor in a qualitative study [18].

Credibility was achieved through a well-thought-out research design and by using a method of analysis prescribed for a grounded theory study. Dependability was maintained by using the same

semistructured interview guide to collect data and by reviewing key decision points during data analysis for content stability with three municipal PHN participants who hold a position of assistant manager or higher. Confirmability was achieved by establishing that there was no gap between the analysis result and the actual activities at the meeting where most of the participants attended, to reach a consensus on the interpretation of the findings. Furthermore, validity of the results was obtained by having them reviewed by three researchers who teach PHN students at a nursing college and have expertise in qualitative analysis, representing third-party experts. Transferability was enhanced by substantial descriptions of the work of the PHNs and the previous literature context.

### Ethical considerations

After the heads of the departments where the municipal PHNs were deployed received an oral and written explanation of the study purpose and provided written informed consent, each municipal PHN received an oral and written explanation of the study purpose, including assurances that their participation in the study was voluntary, regardless of the desires of their department head, and that they had the right to withdraw from the study at any time; furthermore, they were also asked to provide written informed consent. At that time, they were also informed that their decision on whether to participate in this study would not affect assessments in the workplace or of their jobs. This study was approved by the Ethics Committee of the Kyoto University Graduate School and Faculty of Medicine (Approval no. 943) and conformed with the requirements of the Declaration of Helsinki.

## Results

### Participant characteristics

A total of 29 participants were included in this study; 28 (96.6%) of these were woman PHNs, and overall, the group had  $11.94 \pm 7.21$  years (range, 3–32 years) of experience. Five (17.2%) participants had a position of assistant manager or above. Regarding final academic records (basic educational institutions for PHNs), nine (31.0%) were college graduates (for details, see Table 1). The duration of the interviews was  $78.91 \pm 28.14$  minutes (range, 45–170 minutes).

**Table 1** Participant Characteristics (N = 29).

Characteristics	n (%) or mean $\pm$ SD
Age (yrs)	36.59 $\pm$ 7.14
Gender, women (vs. men)	28 (96.6)
Years of experience as a PHN (yrs)	11.94 $\pm$ 7.21
Years of experience as a non-PHN (yrs)	1.31 $\pm$ 2.26
Job position, chief and above (vs. staff)	5 (17.2)
Years of experience as a chief and above (yrs)	0.53 $\pm$ 1.56
Experience of transfer of department in charge, yes (vs. no)	22 (75.9)
Experience assigned other than health department, yes (vs. no)	15 (51.7)
Education for PHN	
Vocational school	17 (58.6)
Junior college	3 (10.3)
College	9 (31.0)
Graduate school	0 (0.0)
Marital status	
Unmarried	11 (37.9)
Married	16 (55.2)
Divorce (including death)	2 (6.9)

Note. PHN = public health nurse; SD = standard deviation; yrs = years.

## Storylines

First, using the concepts and categories created in the analysis, the storylines were summarized to explain the relationship between the concepts within each category (the results are shown in Figure 1). One core category, two categories, and six concepts were identified as factors (e.g., conditions or actions) of the process of structuring community health needs through daily practice. In the following text, the core category, category, and concept are displayed within quotation marks.

The municipal PHNs subjectively understood community characteristics and “used their five senses (i.e., sight, hearing, smell, taste, and touch) to understand the relationship between the health and life of people” by “frequently visiting the community they were responsible for” and “having an interest greater than their duty for the community they oversaw.” They also comprehensively understood the relationship between health and life by “considering those who do not seek help to others” and those who could not ask for help by “learning from stakeholders,” such as patients and local residents. Furthermore, the PHNs were also endeavoring to obtain an image of the overall situation not only from subjective phenomena but also from objective phenomena. By “realize and evaluate clinical practice through visualization,” PHNs reflected on past activities as well as determining the direction of future activities. In addition, as they “realize[d] and evaluate[d] clinical practice through visualization,” they attempted to comprehend the entire target public health population by attending to “considering those who do not seek help to others.” This described content was regarded as Step 1 in the process of structuring the regional health needs and was called “identifying and grouping community characteristics from vague community phenomena.” The left side of Figure 1, which can be seen head-on, shows the step in the brain of individual PHNs, which is attracting something of subjective community characteristics on the right-hand side, and is attracting something of objective community characteristics on the left-hand side, in a considerable amount of vague phenomena.

To avoid selfish misunderstandings based on the subjective phenomena, the PHNs decided to “convert subjective phenomena into qualitative data through data sharing.” In addition, to verify objective phenomena, they used community characteristics and health needs “obtained through objective data generation supported by quantitative data” to “realize and evaluate clinical practice through visualization.” These subjective and objective phenomena neither contradicted nor were superior to each other. The PHNs structured community health needs by collaborating through “fusion/integration after mutual agreement of subjective and objective measures.” Their confidence level regarding their ability to resolve regional health problems then gradually increased, eventually becoming robust. This described content was regarded as Step 2 of the process of structuring regional health needs and was called “linking the threads of community characteristics to create a robust knot.” The right side of Figure 1, which can be seen head-on, shows the step in which the community health needs are clearly connected after identifying and linking the subjective and objective community characteristics.

These two steps were constructed as “the process by which PHNs structure community health needs through daily practice.”

*Concept (1): “Having an interest greater than their duty for the community they oversaw.”*

This concept shows that having an interest in the community rather than viewing it as an obligation is a starting point for activity.

*If I am not interested in the community, it is difficult to understand what I have seen or heard. (ID: 17)*

By separating out the role of an expert as a PHN and being aware of his or her perspectives as a resident, it is possible for PHNs to sensitively understand the local activities and people’s lives.

*I also have a family and children. As I live here as a member of the community, I sometimes hear people’s real feelings and honest*

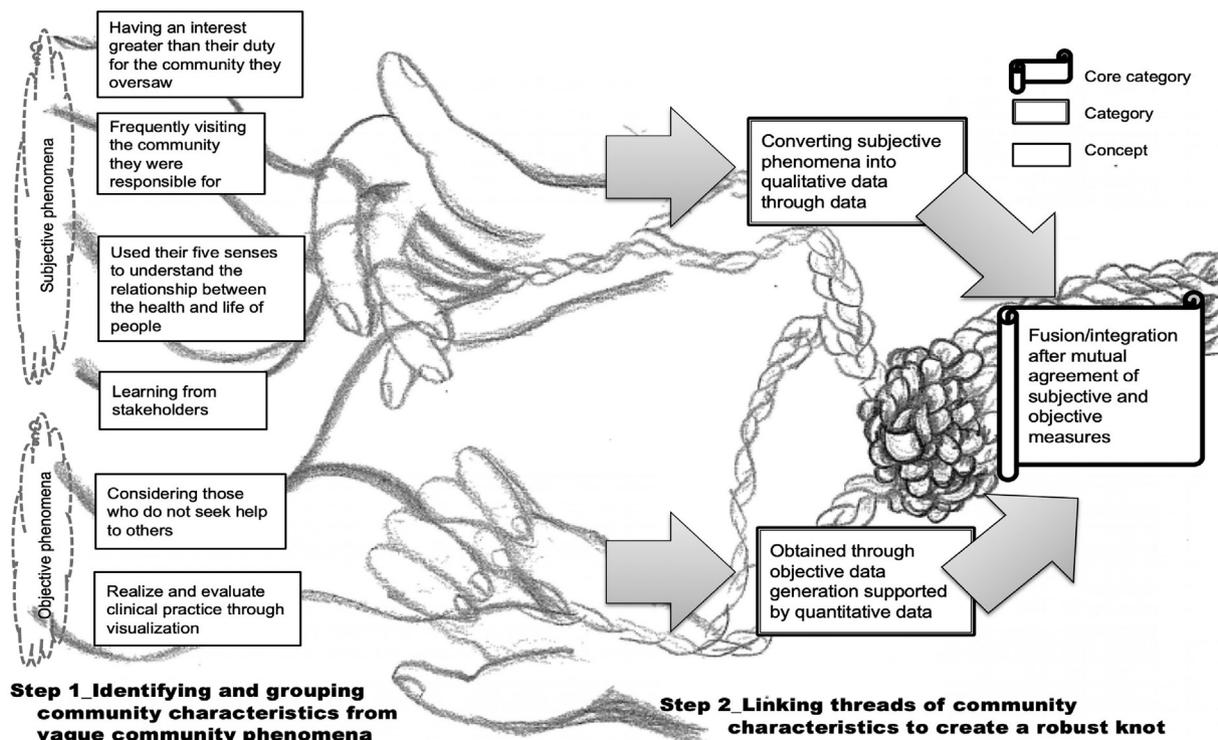


Figure 1. The process of structuring community health needs by public health nurses through daily practice.

opinions, which I don't hear as a PHN. So, I think I can identify community characteristics and health problems through my life experiences. (ID: 08)

Concept (2): “Frequently visiting the community they were responsible for.”

In terms of voluntarily visiting the community and effectively using the experiences obtained through these visits, the concept was identified from the following interviews.

*I am ashamed to admit it, but at the beginning of my first year I could not even find addresses in the district I was in charge of. So, I walked around the district during my free time on public holidays. Then, I learned more about the narrow paths, steep slopes, and the fact that the mountain village is in the shade in the afternoon. (ID: 09)*

Visits to the community not only allowed PHNs to gain the opportunity to learn about the lives of local people but also led to the chance for people in the community to learn about the role and existence of PHNs.

*The most important thing to do is to learn the lifestyles, values, and the atmosphere of the community when I visit the community to provide health consultations and workshops. (ID: 06)*

*As a young public health nurse, I think it is very important for people in the community to remember PHNs' faces and names, so I participate in various local events and events as much as possible. Because I think it is important to exist with people in the same time and the same community. (ID: 03)*

Concept (3): “Learning from stakeholders.”

Only stakeholders such as patients and local residents may be able to inform PHNs of their circumstances.

*When I have established connections with powerful key persons in the community, I'll get to know many people who can help me. Then, I have opportunities to examine whether the problems I identified during my practice as a PHN and the reality match, and also have opportunities to learn how people have found themselves in their present situations. (ID: 22)*

This narrative episode also helped identify the concept of “used their five senses to understand the relationship between the health and life of people.”

As the care targets high-risk groups, PHNs realize that it is important to understand the actual conditions of people living at the lowest levels of society.

*By talking with those who are unable to receive treatment because they cannot afford the medical expenses, or those who are experiencing difficulties after losing their jobs as a result of corporate downsizing, you can learn about their difficulties and the root causes leading to such situations. These are things that only those who experience difficulties know. (ID: 01)*

Concept (4): “Used their five senses to understand the relationship between the health and life of people.”

This concept was identified in conjunction with the aforementioned “visiting the community” and “learning from stakeholders.” It was identified from the opinions that it is difficult to separately treat health needs and lives and that it is important not only to determine the data and information themselves but also to comprehensively understand the relationship between health and life.

*By participating in the events and festivals in community, and eating the same as people in the community, we can taste the usual food to determine how much salt is in their daily meals. (ID: 14)*

Furthermore, this concept includes the importance of supporting living continuously in this community by cultivating the competency to imagine everyday life and life histories.

*When visiting the community during the agricultural season, we often see situations where people are working long hours while bending at their waist. We have become acutely aware that these working conditions could lead to back and knee pain. However, even if I advise one-sided idealism as a healthy life plan, they will not accept it. (ID: 26)*

Concept (5): “Considering those who do not seek help from others.”

This concept was identified in conjunction with the aforementioned “learning from stakeholders” and refers to the consideration and inclusion of those with potential health needs and those who cannot ask for help as patients in public health nursing.

*It is not sufficient to provide consultation only to those who visit the clinic. I always wonder whether the outpatients have family and friends who cannot visit us, or who have been forgotten. (ID: 10)*

Concept (6): “Realize and evaluate clinical practice through visualization.”

This concept can be “obtained through objective data generation supported by quantitative data” and can help with the evaluation of subjective phenomena.

*After all, data analysis of health promotion planning can provide evidence of past practices and the bases of past activities. (ID: 04)*

*As seen in data concerning registered patients with intractable diseases applying for medical expenses, it is evident that there are people other than those whom we have met who also require support. Thus, we began to think about how we can establish a connection with such people. (ID: 10)* This narrative episode also helped identify the concept of “considering those who do not seek help from others.”

Category (1): “Converting subjective phenomena into qualitative data through data sharing.”

This category showed the PHNs' process of identifying subjective community characteristics and health needs, as well as that for recognizing their own subjective phenomena. The sharing with others under this category was found to be a generic term for a method of multilaterally evaluating events through feedback from senior PHNs and colleagues, collaboration with local residents, and discussion with people in other fields.

*I reviewed my practice records and the senior PHNs' advice and found that they matched my evaluation of community characteristics. (Participant ID: 06)*

In addition, verbalizing a phenomenon that is perceived as an ambiguous sensation through talking to another person creates qualitative data, regardless of whether the person is conscious of this process. This is also an action that can be interpreted as a process of gradually approaching certainty from ambiguity by being understood by others.

*Information sharing with PHNs might lead to biases. Consequently, I intentionally have meetings with people from other fields to recognize my common ground with other professionals. (ID: 04)*

*Category (2): “Obtained through objective data generation supported by quantitative data.”*

This category included competencies regarding the comprehensive evaluation of the current status of the community through conducting comparisons with other communities as well as competencies relating to predicting the future by reviewing past clinical courses. As one method of verifying the aforementioned “considering those who do not seek services,” the participants tried to use “objective data obtained and supported through quantitative data” and to consider people who could not seek services. In other words, there may be an interaction between these categories and concepts.

*Competence to predict the future is required. To achieve this, it is necessary to accurately analyze current health needs. Otherwise, it is impossible to predict the future (i.e., 10 years from now). (ID: 15)*

*Core category: “Fusion/integration after mutual agreement supported from both subjective and objective measures.”*

Qualitative data occasionally reveal the actual state of quantitative data, and a comprehensive overview that cannot be fully understood using qualitative data alone can occasionally be obtained using quantitative data analysis. In other words, the PHNs “converted subjective phenomena into qualitative data through data sharing” to “realize and evaluate clinical practice through visualization.” The mutual/synergistic interaction and fusion/integration of the two categories helped to clarify the community health needs.

*The reports that were created by the opinions and the data regarding their lives of community residents make it easier to persuade the boss. (ID: 19)*

*It is superficial to take health needs identified in a survey and data at face value. It is important to identify the needs that depict the actual lives and opinions of the local residents. (ID: 12)*

*Sometimes, I find both convincing results and unlikely results in practice reports submitted by students. When I consider the unlikely results, I begin to think about the community. When I successfully identify the cause of the unlikely results, I realize my reflections about the community. (ID: 22)*

*The digitization of information helps me to clarify my vague understandings of my practice and leads to clear recognition. (ID: 02)*

## Discussion

The aim of this research was to determine how municipal PHNs realize that they are identifying and structuring community health needs in their daily practice. The findings of this study showed that individual PHNs gained an understanding of some of the subjective community characteristics through a number of vague phenomena as a result of their daily interaction with community residents. On the other hand, the PHNs had clinical questions based on the objective data that might lead to community characteristics.

One of the noteworthy strengths of this study is that it shows that the participating PHNs recognized the importance of understanding community health needs through daily practice. Most of these concepts were identified in partial statements from the participants. At first, a PHN could learn some community

characteristics from a less-defined community atmosphere by individuals' sensitivities, as if they are spinning some thread. Then, (s) he might be to confirm these ideas with a colleague or by looking at objective data and then gradually to come to definitively prove community needs, as if they are twisting or weaving together the threads.

The core category identified in this analysis supports the theories mentioned in the following text, but this is not a new finding. Existing community health assessment theories, especially the existing community-as-partner model, emphasize the importance of the clarification of health needs through “fusion/integration after mutual agreement of subjective and objective measures” [8]. However, many of the participants' opinions led to the digitization of subjective phenomena and the identification of multiple concepts.

This study also attempted to examine how PHNs clarify the process of identifying the community health needs structure. The findings of the present study show that PHNs structured community health needs by collaborating through the “fusion/integration after mutual agreement of the subjective and objective measures.” As a result, their confidence level regarding their ability to resolve community health problems increased, leading to a robust structure.

The second noteworthy strength of this study is the finding that clarified that becoming convinced of the community health needs through sharing and confirming community data is a process that involves not only PHNs but also other people. Specific methods of sharing and confirming community data include collaboration with people in other fields [19–21], collaboration with local residents [19,22] and the active use of on-the-job-training feedback [22] from senior PHNs and colleagues. Some participants emphasized the importance of objective/quantitative data rather than subjective/qualitative data to understand community health needs. In recent years, with the emergence of health-promotion practices, the ability to conduct population-based community health assessments has become an essential skill for PHNs, who are very aware of the importance of the digitization of practical activities and goals [23]. However, it cannot be considered as a reason not to require subjective/qualitative data. Regarding yet another aspect of such situations, some participants “considered those who did not seek services” or those whom they had not met and attempted to identify the community health needs of these people. This is critical in regard to public health patients. In other words, these subjective and objective phenomena neither contradict each other nor are superior to each other. Thus, it is important to address these two rotationally, an approach supported by the finding that the concept of “realize and evaluate clinical practice through visualization” was identified through “fusion/integration after mutual agreement of subjective and objective measures.”

Of the Plan-Do-See cycle, the Do-period in public health practice is much longer than that in clinical nursing practice. As the training of most of the new PHNs begins during the Do-period, they seem to have high anxiety and suffer because of a gap between what they learned in basic education and the reality, feeling that they cannot find sufficient time to perform systematic/comprehensive community health assessments during their busy daily practice. Thus, it seems important to provide them with an opportunity to accumulate experience in community health assessments over shorter cycles (e.g., projects, districts, and routine practice) of “fusion/integration after mutual agreement of subjective and objective measures.” In addition, instead of relying on each PHN's practical competencies and willingness to participate in training, it is necessary to establish a systematic, continuous education system [24]. Discussions that include both new PHNs and experienced senior PHNs may not only help improve the quality of community health assessments but also contribute to professional human-resource development. Discussion on the quality of conceptual

elements may lead to improvements in the quality of daily practice itself. Furthermore, when students and PHN trainees, or faculty members and PHN trainees, help each other, the quality of community health assessments can be improved, and the gap between education and practice can be reduced [25]. This would further lead to the development of new services that meet local needs and that are based on appropriate community health assessments [26].

This study has a limitation. The participants of this study were from two municipalities in a rural area. Therefore, it will be necessary to compare and examine these results with those of municipal PHNs in urban areas in the future.

## Conclusion

Municipal PHNs recognize the importance of understanding community health needs while engaging in busy daily practice that prioritizes support for high-risk patients. The municipal PHNs in this study “converted subjective phenomena into qualitative data through data sharing,” which was important for avoiding misinterpretation. In addition, they used regional characteristics and practice challenges “obtained through objective data generation supported by quantitative data” to “realize and evaluate clinical practice through visualization.” These subjective and objective phenomena neither contradicted each other nor were superior to each other, and structured community health needs by affecting each other through “fusion/integration after mutual agreement of subjective and objective measures.”

It is suggested that the effective promotion of community assessment is expected through the following practices: (1) self-development to improve subjective senses (e.g., knowledge of self-values and ethics, awareness through the open mind), (2) verbalization of events obtained through those senses, (3) confirmation of these verbalizations with colleagues, those outside the profession and residents, and (4) examination of the consistency of qualitative and quantitative data. In other words, these results suggest the importance of increasing the self-improvement of PHNs as individuals, as well as sharing community health needs with others through daily practice.

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## Declaration of competing interest

The author has no conflict of interest.

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