

[ORIGINAL ARTICLE]

Categorization and Characterization of Activities Designed to Help Health-care Professionals Involved in Hepatitis Care Increase Their Awareness of the Disease: The Classification of Hepatitis Medical Care Coordinators

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Abstract:

Objective This study aimed to investigate the current state of the activities performed by hepatitis medical care coordinators, categorize coordinators according to the activities they perform, and determine the backgrounds of these coordinators.

Methods A self-administered questionnaire survey was completed by 414 coordinators. The surveyed items included gender, occupation, activity items performed, and barriers that inhibited the performance of these activities. A hierarchical cluster analysis was applied, and cases were classified based on the contents of the activities in question.

Results The coordinators were classified into four groups (A-D). Group A, consisting primarily of public health nurses, was classified as “the type that conducted activities aimed at providing information and recommendations.” Group B, which included registered dietitians and clerks, was classified as “the type that uses multidisciplinary collaboration to perform their tasks.” Group C, which included clinical nurses, was classified as “the type that was more likely to perform activities as leaders in an organization.” Group D, consisting primarily of pharmacists, was classified as “the type that promoted activities centered on providing instructions regarding medication dosage and administration.”

Conclusion Our study showed that coordinators’ professional skills and abilities are reflected in the contents of the activities they conduct, and that, to adequately perform their roles, they must acquire skills in addition to those required in their original occupations. To implement high-quality hepatitis countermeasures, there is a need to foster an environment that facilitates cooperation between coordinators, as well as relationship-building.

Key words: viral hepatitis, hepatitis medical care coordinator, enlightenment

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Introduction

In 2015, the global number of individuals infected with viral hepatitis (type B or type C) reached approximately 325 million (1); viral hepatitis often leads to cirrhosis and liver cancer (2-4), which are major health issues. Recent reports have estimated that, in the year 2000, the number of people

infected with the hepatitis B virus in Japan was between approximately 1,100,000 and 1,400,000, while the number of those infected with hepatitis C was between approximately 1,900,000 and 2,300,000 (5). In response to this large amount of cases, in 2002, Japan introduced comprehensive urgent measures against hepatitis C (6), conducted systematic hepatitis virus testing, implemented various measures and efforts, and promoted the treatment of hepatitis through

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making improvements to people's environments. However, field work has shown that a large number of infected individuals are unaware that they have hepatitis (7, 8) and consequently fail to consult medical institutions; furthermore, even when virus-screening tests return positive results, some people refuse to seek medical help. Thus, adequate measures must be taken to assist this patient group.

In Japan, the Basic Guidelines for Promotion of Control Measures for Hepatitis (hereinafter the *Basic Guidelines on Hepatitis Measures*) (9) were created in 2011 based on the *Basic Act on Hepatitis Measures*. The guidelines mention the need to train human resources in how to prevent hepatitis infection and guide individuals with hepatitis toward receiving suitable hepatitis-related medical care. In June 2016, the *Basic Guidelines on Hepatitis Measures* were revised and now mention the need to reinforce the securing and training of human resources who are capable of responding to the various problems faced by hepatitis patients. Such human resources are known as "hepatitis medical care coordinators," and the first group of these professionals has recently been trained, with 34 prefectural and city governments in Japan providing training courses (10). Multiple reports have shown that individuals with hepatitis suffer from a poor understanding of the disease, fatigue, the side effects of treatment, and anxiety concerning the progression of the disease, while their quality of life (QOL) is directly affected by the disease itself (11-17); in addition, several reports have indicated the existence of prejudice and discrimination against people with infectious diseases (18, 19). Previous studies on support for patients with hepatitis C (20) have shown that the individual needs of each patient must be addressed, and that better understanding of individual needs is linked to increased appropriateness of the provided care.

In order to promote the hepatitis countermeasures currently employed in Japan, the ability to respond to various issues is necessary, along with the capability to provide hepatitis care using clinical laboratory tests and medical treatment. In April 2017, the Ministry of Health, Labour and Welfare published a notification regarding the training and assignment of hepatitis medical care coordinators (21). The notification described the basic roles of hepatitis medical care coordinators and the scope of their activities and stipulated that improvements and revisions to these activities should be made when needed, depending on the progression of hepatitis care and the status of the hepatitis countermeasures employed by each prefectural and city government. However, the current status of hepatitis medical care coordinators' activities and the actual issues they encounter in the field have not yet been clarified. We therefore conducted this study in order to determine the activities that coordinators currently perform, to categorize coordinators according to the activities they perform, and to elucidate the features of each category.

Materials and Methods

1. Participants

The survey participants comprised 414 people who had been certified as hepatitis medical care coordinators after having attended a two-day workshop organized by the Division of Health Promotion, Head Office of the Department of Health and Welfare, Saga Prefectural Government. Of the 354 individuals who agreed to cooperate in our study, the final analysis was conducted on the 318 people who answered the questionnaire in full (valid response rate: 76.8%).

2. Survey method

The survey period was October 2011 to October 2013. The study consisted of an anonymous, self-administered questionnaire distributed at a follow-up training session for hepatitis medical care coordinators that was conducted six months after they received their certifications. The surveyed items concerned gender, occupation, performance of certain activities, and the existence or absence of items influencing the ability to perform such activities. Specifically, the participants were requested to indicate whether the contents of the following 13 items applied to them: "I have answered questions about hepatitis virus testing," "I have recommended people undergo hepatitis virus testing," "I have answered questions about free hepatitis virus testing," "I have answered questions about hepatitis as a disease," "I have answered questions about the treatment of hepatitis," "I have answered questions about liver diseases other than hepatitis," "I have answered questions about the medical expenditure subsidy system for the treatment of hepatitis," "I have given consultations concerning the side effects of interferons (IFN)," "I have given consultations concerning the side effects of nucleic acid analogue preparations," "I have participated in our hospital's (or facility's) workshops on liver diseases," "I participate in the management and hosting of workshops on liver diseases," "I have organized training sessions on liver diseases for hospital staff (or for facility personnel)," and "I interact with other hepatitis medical care coordinators working in other facilities." For the items concerning deficiencies regarding the activities, the participants were requested to report whether they felt a lack of any of the following eight items: "knowledge," "time," "opportunities," "self-confidence," "environment," "workforce," "consultation desks," or "reference materials."

3. Analysis method

To score the items concerning the activities, each response of "no" was awarded 0 points, while each response of "yes" was awarded 1 point. The scores of the activity items were subjected to a hierarchical clustering analysis using Ward's method, and cases were classified based on the similarities between activity contents. The features of each group classified in the clusters were determined by using the chi-square

Table. Details Regarding the Hepatitis Medical Care Coordinators Surveyed in This Study.

Items	Number of respondents (%)
Sex	
Male	24 (7.5)
Female	294 (92.5)
Profession	
Public health nurse	125 (39.3)
Clinical nurse	130 (40.9)
Pharmacist	18 (5.6)
Clinical laboratory technician	12 (3.8)
Other (national registered dietitians, office workers, etc.)	33 (10.4)

n=318

The numerical values represent the number (and percentage) of hepatitis medical care coordinators in the indicated category.

test to compare participants' occupations, the performance or non-performance of the activity items, and the existence of activity deficiencies in each group. For comparing public health nurses and nurses, we used Fisher's exact test. Statistical analyses were performed using the SPSS Statistics software program, ver. 23.0 (IBM Japan, Tokyo, Japan), and the significance level was set at less than 5%.

4. Ethical considerations

The purpose of the survey and method were explained to the participants using written documents, and they were assured that their responses would be anonymous and that the data obtained from the survey would be processed statistically. Consent to participate in the survey was obtained upon collection of the questionnaire. This study was conducted with the approval of the Ethics Committee of Saga University Medical School.

Results

1. Overview of hepatitis medical care coordinators

Table shows an overview of hepatitis medical care coordinators. In terms of gender, a majority of coordinators were women (92.5%). In terms of occupation, the highest proportion was that of clinical nurses (40.9%), followed by public health nurses (39.3%). Fig. 1 shows the coordinators' responses with regard to whether or not they performed each activity item. The most commonly performed activities were "I have answered questions about hepatitis virus testing" (55.0%) and "I have recommended people undergo hepatitis virus testing" (54.7%). The least commonly performed activity was "I participate in the management and hosting of workshops on liver diseases" (5.0%).

2. Classification of hepatitis medical care coordinators based on activity items

A hierarchical cluster analysis was conducted based on the activity items, and the results showed that the hepatitis

medical care coordinators could be classified into four separate groups (Fig. 2). Fig. 3 shows the results of a comparison of the hepatitis care coordinators' occupations, classified by group; Fig. 4 shows the results of a comparison of the performance of activity items, also classified by group; and Fig. 5 shows the results of a comparison of items concerning deficiencies that influenced the performance of activities.

Group A (n=119) contained a significantly higher proportion of public health nurses (56.3%; $p<0.01$) than other professions. On comparing items pertaining to the performance of activities, a significantly higher number of participants answered "yes" than "no" to the following ($p<0.01$): "I have answered questions about hepatitis virus testing," "I have recommended people undergo hepatitis virus testing," "I have answered questions about free hepatitis virus testing," "I have answered questions about hepatitis as a disease," and "I have answered questions about the medical expenditure subsidy system for the treatment of hepatitis." In contrast, a significantly higher number of participants responded "no" than "yes" to the following items ($p<0.01$): "I have given consultations concerning the side effects of IFN," "I have given consultations concerning the side effects of nucleic acid analogue preparations," "I have participated in our hospital's (or facility's) workshops on liver diseases," and "I have organized training sessions on liver diseases for hospital staff (or for facility personnel)." A comparison of the items concerning deficiencies that negatively influence the performance of activities showed no significant difference.

Group B (n=104) contained significantly more participants with occupations such as national registered dietitians and office workers than other professions (15.5%; $p<0.01$). On comparing the performance of activity items, significantly more participants answered "no" to all items than "yes" ($p<0.01$). Regarding items concerning deficiencies that negatively influence the performance of activities, a significantly higher number of participants answered "lack of opportunities" than any other item (40.5%; $p=0.005$).

Group C (n=53) contained a significantly higher number of clinical nurses than other professions (62.3%; $p<0.01$). On comparing the performance of activity items, significantly more participants answered "yes" to all items than "no" ($p<0.01$). Regarding deficiency-related items, a significantly higher number of participants answered "lack of workforce" than any other item (27.5%; $p=0.038$).

Group D (n=42) contained a significantly higher number of pharmacists than other professions (21.4%; $p<0.01$). On comparing the performance of activity items, significantly more participants answered "yes" than "no" to the following items ($p<0.01$): "I have answered questions about the treatment of hepatitis" and "I have given consultations concerning the side effects of IFN." In contrast, significantly more participants answered "no" than "yes" to the following items ($p<0.01$): "I have answered questions about hepatitis virus testing," "I have recommended people undergo hepatitis virus testing," and "I have answered questions about free hepatitis virus testing." Among the deficiency-related items,

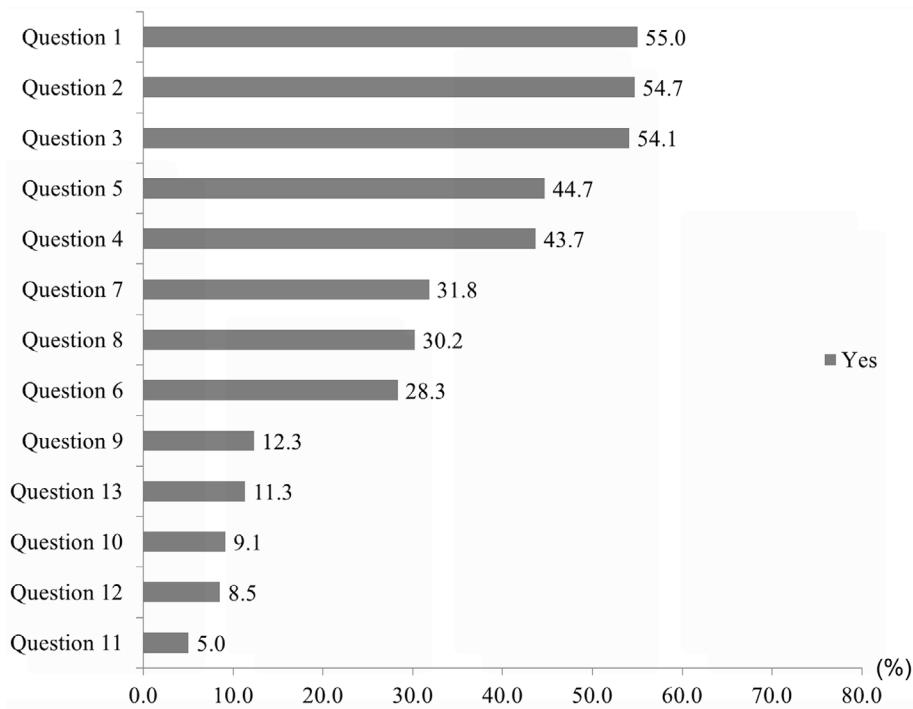


Figure 1. The proportion that answered “Yes” regarding the presence of the activity item is shown. Question 1: I have answered questions about hepatitis virus testing. Question 2: I have recommended people undergo hepatitis virus testing. Question 3: I have answered questions about free hepatitis virus testing. Question 4: I have answered questions about hepatitis as a disease. Question 5: I have answered questions about the treatment of hepatitis. Question 6: I have answered questions about liver diseases other than hepatitis. Question 7: I have answered questions about the medical expenditure subsidy system for the treatment of hepatitis. Question 8: I have given consultations concerning the side effects of IFN. Question 9: I have given consultations concerning the side effects of nucleic acid analogue preparations. Question 10: I have participated in our hospital’s (or facility’s) workshops on liver diseases. Question 11: I participate in the management and hosting of workshops on liver diseases. Question 12: I have organized training sessions on liver diseases for hospital staff (or for facility personnel). Question 13: I interact with other hepatitis medical care coordinators working in other facilities.

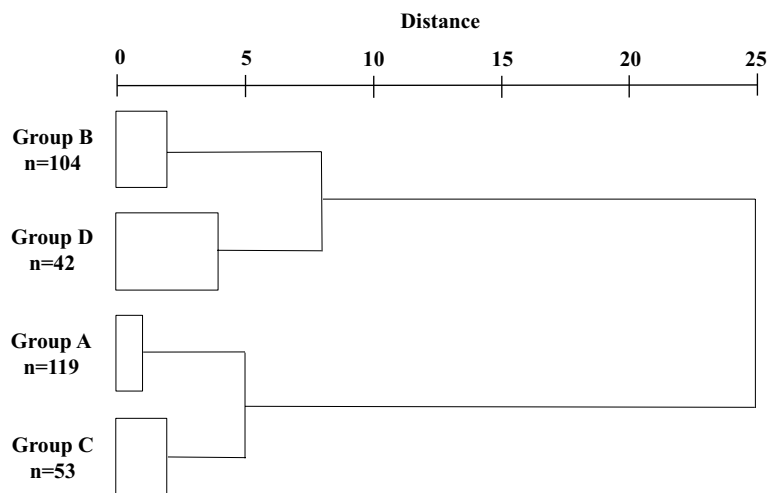


Figure 2. The results of cluster analyses of the activity items showed that the dendrogram was divided into four clusters, with a distance coefficient of 4.5.

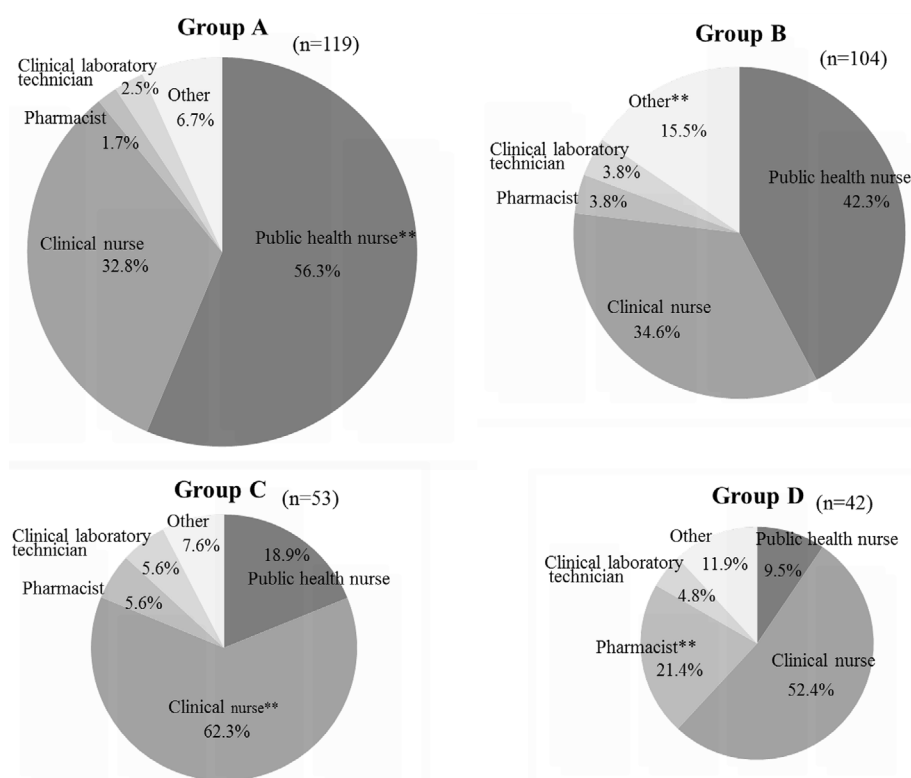


Figure 3. A comparison of the occupations in each group was conducted using the χ^2 test, with the breakdown of occupations shown. * $p<0.05$, ** $p<0.01$.

significantly more participants answered “lack of reference materials” than any other item (29.4%; $p=0.023$).

3. Sub-analyses for the difference of consultations and engagements between public health nurses and clinical nurses

On comparing the performance of activity items, the prevalence of the following items was significantly higher in clinical nurses than in public health nurses: “I have answered questions about the treatment of hepatitis” ($p=0.002$), “I have given consultations concerning the side effects of IFN” ($p<0.01$), “I have given consultations concerning the side effects of nucleic acid analogue preparations” ($p<0.01$), “I have participated in our hospital’s (or facility’s) workshops on liver diseases” ($p=0.001$), “I participate in the management and hosting of workshops on liver diseases” ($p=0.035$), and “I have organized training sessions on liver diseases for hospital staff (or for facility personnel)” ($p<0.01$) (Fig. 6). Among the deficiency-related items, the prevalence of the following responses was significantly higher in clinical nurses than in public health nurses: “lack of time” ($p=0.001$), “lack of adequate environment” ($p=0.031$), “lack of workers” ($p=0.001$), “lack of available consultation desks” ($p=0.009$) and “lack of reference materials” ($p=0.006$) were significantly higher in clinical nurses (Fig. 7).

Discussion

This study is the first report to classify hepatitis medical care coordinators based on the contents of their activities, and it facilitates the identification of the features of each group of coordinators. Our findings revealed that hepatitis medical care coordinators have various background occupations, such as public health nursing, clinical nursing, and pharmacy. In addition, our findings also showed that the skills and abilities associated with each of the coordinators’ original occupations are reflected in the content of their activities. However, our study also revealed that hepatitis medical care coordinators must acquire additional skills to those they employ in their original occupational fields. For example, the performance rate of all activity items was significantly higher in group C, which mainly contained clinical nurses, than in other groups, while group D, which contained a large number of pharmacists, showed a significantly high performance rate even for items that did not relate to the side effects of IFN.

Our study showed that most hepatitis medical care coordinators are nursing personnel, such as public health nurses and clinical nurses. Public health nurses and clinical nurses are the health professionals who have the closest contact with patients and the general population and are expected to demonstrate coordinating skills in their roles. However, individuals in other occupations have also become successful hepatitis medical coordinators, such as national registered

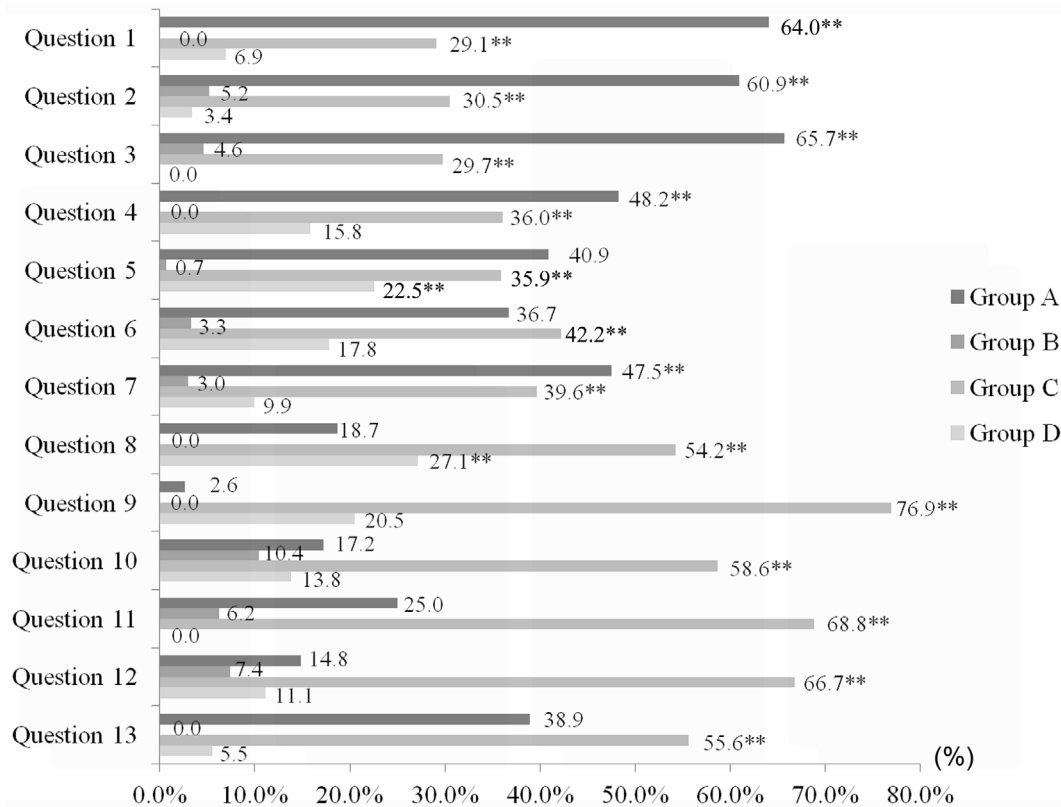


Figure 4. A comparison of the implementation of activity items in each group was conducted using the χ^2 test, with the ratio of respondents answering “yes” shown. * $p < 0.05$, ** $p < 0.01$. Question 1: I have answered questions about hepatitis virus testing. Question 2: I have recommended people undergo hepatitis virus testing. Question 3: I have answered questions about free hepatitis virus testing. Question 4: I have answered questions about hepatitis as a disease. Question 5: I have answered questions about the treatment of hepatitis. Question 6: I have answered questions about liver diseases other than hepatitis. Question 7: I have answered questions about the medical expenditure subsidy system for the treatment of hepatitis. Question 8: I have given consultations concerning the side effects of IFN. Question 9: I have given consultations concerning the side effects of nucleic acid analogue preparations. Question 10: I have participated in our hospital’s (or facility’s) workshops on liver diseases. Question 11: I participate in the management and hosting of workshops on liver diseases. Question 12: I have organized training sessions on liver diseases for hospital staff (or for facility personnel). Question 13: I interact with other hepatitis medical care coordinators working in other facilities.

dietitians and office workers.

In terms of the performance status of activity items, items related to hepatitis virus testing (including recommending screening tests) tended to have a high rate of performance, followed by items regarding hepatitis as a disease and its treatment. This suggests that, for coordinators, the activities described in the items related to hepatitis virus testing are easy to perform, and there are many opportunities to do so. Therefore, in the initial stages after becoming a coordinator, it is essential that they gain basic knowledge regarding hepatitis as a disease and its treatment and that they begin working on activities aimed at recommending hepatitis virus testing.

Through a cluster analysis based on the activity items, the coordinators were classified into four separate groups. In group A, the performance rate of items related to hepatitis

virus testing, including recommendations to undergo clinical laboratory tests, was high, as was the performance rate of activities pertaining to the medical expenditure subsidy system. As such, group A was labeled “the type that conducted activities aimed at providing information and recommendations.” Generally, public health nurses are equipped with basic skills for practicing public health in local communities and are therefore engaged in educational activities and the provision of appropriate information for promoting health in all areas, including hepatitis (22). Our results also showed that they were involved in information provision activities regarding hepatitis virus testing recommendations and the medical expenditure subsidy system. In the future, the promotion of recommendation-related activities and the provision of correct information about the medical expenditure subsidy system should be equally enacted throughout Japan.

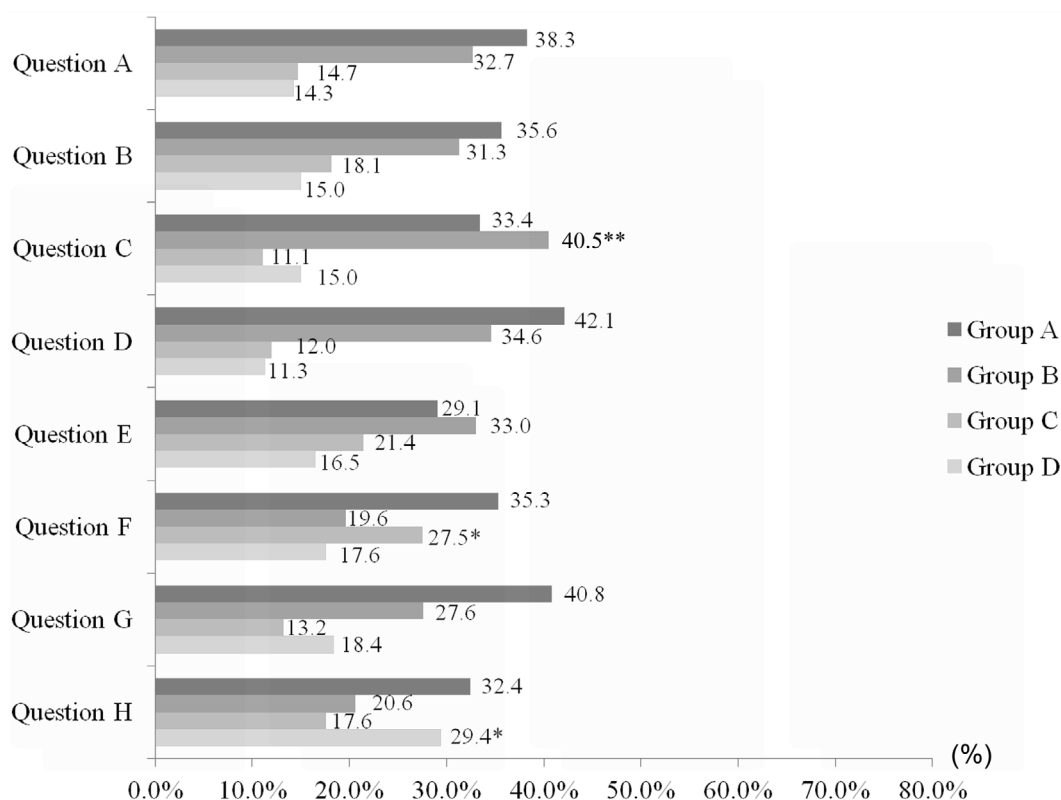


Figure 5. A comparison of activity deficiency-related items in each group was conducted using the χ^2 test, with the ratio of respondents answering “yes” shown. * $p < 0.05$, ** $p < 0.01$. Question A: Lack of knowledge. Question B: Lack of time. Question C: Lack of opportunities. Question D: Lack of self-confidence. Question E: Lack of an adequate environment. Question F: Lack of workers. Question G: Lack of available consultation desks. Question H: Lack of reference materials.

Group B was composed of participants from various occupations, including national registered dietitians and office workers. Those who answered “no” to all activity items accounted for a high percentage, and the proportion of participants who answered that “there was a lack of opportunities to conduct activities” was significantly larger than in other groups. National registered dietitians and office workers rarely directly contact patients regarding activities related to disease and treatment. There are no qualification requirements for hepatitis medical care coordinators (21); instead, interdisciplinary collaboration aimed at guiding individuals with hepatitis to take proper action is considered important. Thus, group B was considered “the type that uses multidisciplinary collaboration to perform their tasks.” As this group has limited opportunities to engage in activities, their chances to participate in activities such as hepatitis virus testing recommendation should be increased and expanded.

Clinical nurses have regular contact with patients in outpatient clinics and hospital wards. The physical and psychological support clinical nurses provide to hepatitis C patients receiving antiviral treatment has been found to have a positive effect, as it increases adherence to medication (23, 24). Previous studies have shown that educational interventions by clinical nurses have helped patients increase their understanding of hepatitis C and improve their QOL (25-28). This group also participated in and hosted workshops on liver

diseases, and the members proved to be leaders who played a central role among coordinators. Concurrently, this group included many participants who felt that the workforce was insufficient to adequately conduct activities. Considering the above, in our study, group C was defined as “the type that was more likely to perform activities as leaders in an organization.” As many activity items are being practiced by group C, they might provide appropriate advice to other groups through daily duties and meetings. However, many clinical nurses felt that there was a lack of personnel. A previous report described that well-trained hepatitis medical care coordinators should be properly organized to foster their active participation in connecting patients with hepatologists in specialized institutions or regional core centers, as well as in the follow-up of such patients (6).

Finally, group D included a high proportion of pharmacists, and our findings showed that the performance rate of activity items relating to the side effects of IFN was high, with many of these participants responding to questions regarding hepatitis treatment. Pharmacists are professionals who can interact with patients during the final stages of a series of procedures performed during medical consultations, such as when patients receive their medications before discharge; therefore, pharmacists may also serve as gate keepers who respond to questions patients cannot ask their physicians during medical consultation. Reports from previous

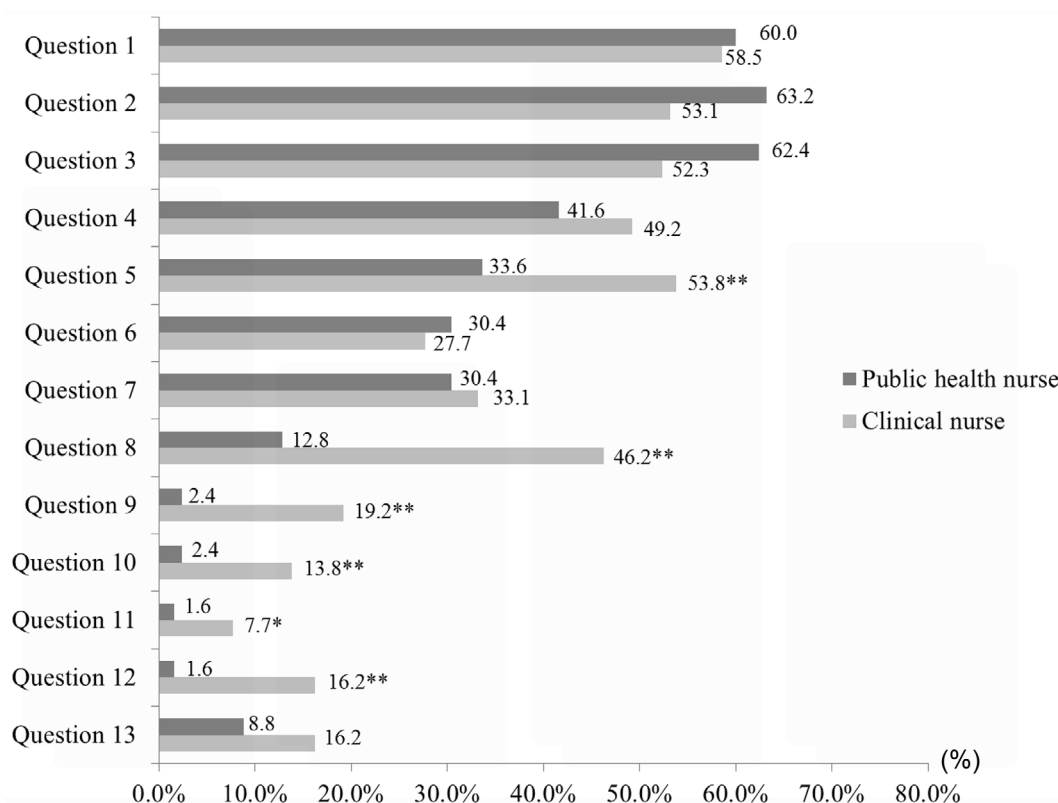


Figure 6. A comparison of the implementation of activity items between public health nurses and nurses was conducted using Fisher's exact test, with the percentage of respondents that answered "yes" shown. * $p < 0.05$, ** $p < 0.01$. Question 1: I have answered questions about hepatitis virus testing. Question 2: I have recommended people undergo hepatitis virus testing. Question 3: I have answered questions about free hepatitis virus testing. Question 4: I have answered questions about hepatitis as a disease. Question 5: I have answered questions about the treatment of hepatitis. Question 6: I have answered questions about liver diseases other than hepatitis. Question 7: I have answered questions about the medical expenditure subsidy system for the treatment of hepatitis. Question 8: I have given consultations concerning the side effects of IFN. Question 9: I have given consultations concerning the side effects of nucleic acid analogue preparations. Question 10: I have participated in our hospital's (or facility's) workshops on liver diseases. Question 11: I participate in the management and hosting of workshops on liver diseases. Question 12: I have organized training sessions on liver diseases for hospital staff (or for facility personnel). Question 13: I interact with other hepatitis medical care coordinators working in other facilities.

studies have indicated that educational intervention by pharmacists regarding patients with hepatitis C have led to greater patient satisfaction in the management of their condition (29), and that this is also effective for relieving anxiety (30). Furthermore, in this group, a significantly larger number of participants than in other groups answered "lack of reference materials" in response to the question concerning deficiencies that negatively influence the performance of activities, and a specific need for concrete teaching materials was expressed. Consequently, group D was defined as "the type that promoted activities centered on providing instructions regarding medication dosage and administration." It will be necessary for this group to use their knowledge as pharmacists to provide information on the side effects of therapeutic drugs and deepen collaboration with other groups. In addition, as this group expressed a need for reference materials, it will be necessary to prepare reference ma-

terials or tools that can be used by hepatitis medical care coordinators.

Our results indicated that clinical nurses demonstrated leadership activities in terms of operating and participating in liver-disease classes and holding study workshops. In contrast, Group C, which had a large proportion of clinical nurses, felt not only a lack of personnel, but also insufficient time, an inadequate environment, and not enough reference materials compared with public health nurses. To resolve these issues, further consideration should be given to events such as workshops, in which various occupations share information and engage in mutual consultation.

Individuals and patients with hepatitis face a broad range of problematic issues and require a wide variety of support that is not limited to hepatitis care. Previous studies examining the prejudice experienced by hepatitis patients in the workplace (31) have shown that approximately 30% people

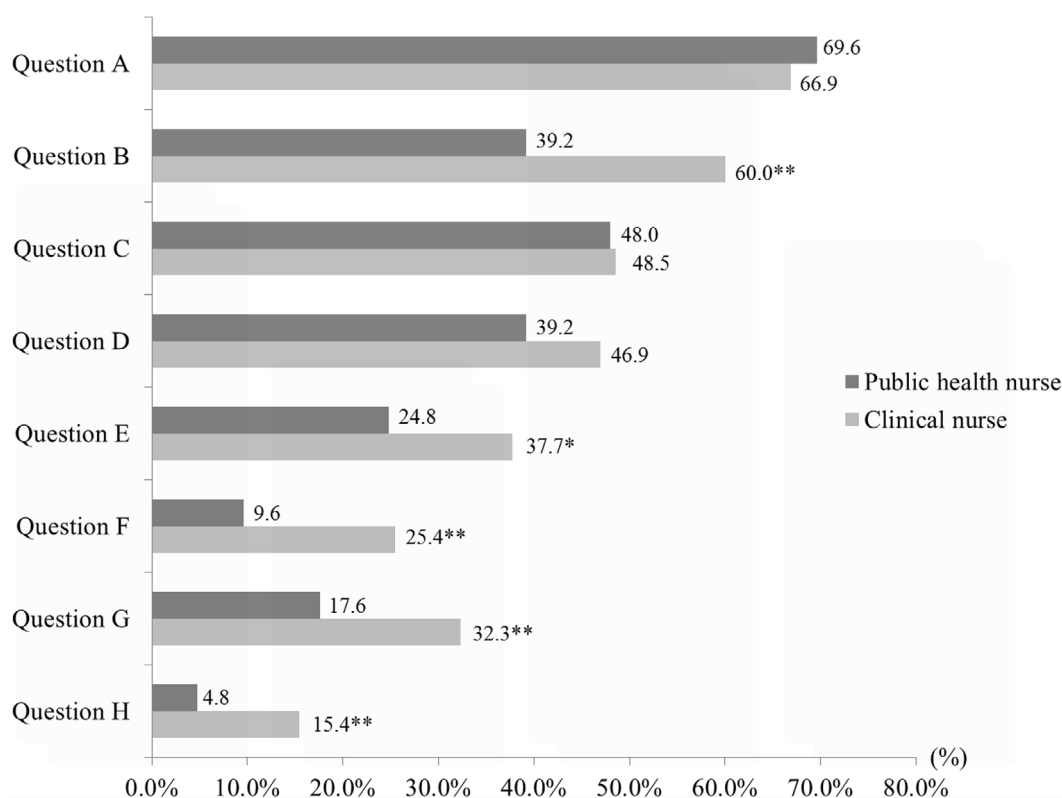


Figure 7. A comparison of activity deficiency-related items between public health nurses and nurses was conducted using Fisher's exact test, with the percentage of respondents that answered "yes" shown. * $p<0.05$, ** $p<0.01$. Question A: Lack of knowledge. Question B: Lack of time. Question C: Lack of opportunities. Question D: Lack of self-confidence. Question E: Lack of an adequate environment. Question F: Lack of workers. Question G: Lack of available consultation desks. Question H: Lack of reference materials.

attempt to engage in as little contact as possible with co-workers who have hepatitis and hold certain prejudices against them. Furthermore, research has shown that individuals and patients with hepatitis fear social prejudice and feel a great deal of apprehension about informing their friends and coworkers that they have the condition (18, 19, 32).

Despite the remarkable progress made recently in the development of pharmacological agents known as direct-acting antivirals (DAAs), which have been found to be particularly beneficial for the treatment of hepatitis C (33), in 2015, only half a million people globally began receiving DAA-based treatment. As such, the number of patients treated with DAAs remains insufficient (34). Furthermore, surveys on the status of counseling and support regarding liver diseases at regional core centers in Japan have shown a remarkable increase in the number of consultation requests related to the medical expenditure subsidy system (6). It will be necessary to approach a broader and larger population as treatment subjects, including the elderly, as well as to provide information that can be understood more easily, such as information on new treatment methods and the complicated workings of the medical expenditure subsidy system. This shows that hepatitis medical care coordinators continue to play an extremely important role in providing support for

hepatitis patients.

In Japan, significant progress has been made with regard to measures against hepatitis, including legislation efforts. However, according to international reports, access to appropriate antiviral therapy after infection remains a concern (35, 36). To overcome these issues, multidisciplinary efforts including the involvement of hepatitis medical coordinators will be more effective than those of physicians on their own, and this study proposed valuable information that will aid in the recognition of and response to these challenges. Our study is a first step toward the development of a new methodology for the training of hepatitis medical care coordinators. Hepatitis treatment is currently undergoing a paradigm shift from IFN-based treatments toward treatments based mainly on oral medications. This also seems to be accompanied by changes in the roles played by hepatitis medical care coordinators. Future studies on this topic should employ updated surveys and acquire new data in order to obtain a better understanding of the current situation.

Conclusion

Through our analysis, we found that hepatitis medical care coordinators could be classified into four separate groups. Our study then revealed that, in each of the groups,

skills and abilities relevant to the coordinators' original occupations are reflected in the activities they perform, although they also require additional skills to comprehensively perform their tasks.

The authors state that they have no Conflict of Interest (COI).

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