

②-3 事例検索システム：条件組み合わせ検索

エクセルのピボットテーブル機能をホームページ上で再現したものです。項目（複数可）を自由に選んで、横軸、縦軸にドラッグすると分割表が表示され、任意の組み合わせで検索条件を設定できます。

条件の組み合わせから検索

項目（複数可）を自由に選んで横軸、縦軸にドラッグすると分割表が表示され、任意の組み合わせで検索条件を設定出来ます。該当する事例の数が分割表に表示され、数字をクリックすると事例No一覧が表示されます。

The screenshot shows a search interface with a list of filter conditions and a pivot table. The filter conditions include:

- 事例No、産業医別ID、事例タイトル、生年月日、事例化した年齢、職種、重量物取り扱い業務
- 深夜勤務、営業・接待等の業務、海外赴任・海外出張、長期出張、長時間の時間外勤務
- 血液や体液を取扱う業務、肝障害を起こす恐れのある化学物質にさらされる業務、飲酒頻度、日本酒換算
- 飲酒期間、ウイルス以外で肝障害の程度を増悪させた要因1、ウイルス以外で肝障害の程度を増悪させた要因2
- ウイルス以外で肝障害の程度を増悪させた要因3、病状、産業医がこの事例を知った経緯
- 本人が感染を知った経緯、就業上の措置内容、主治医との連絡、上司・人事との連絡、措置後の経過
- 事例への対応を振り返って、事業所の職種、労働者数、産業医の基本属性、診療業務の有無

The pivot table below shows the results for the selected conditions:

職種コード	ウイルスの種類	B型肝炎ウイルス		C型肝炎ウイルス		Totals
		女性	男性	女性	男性	
その他			1		1	2
サービス職				1		1
事務職			5	1	7	13
医療職		2	1			3
営業					2	2
営業職			1		2	3
専門研究職		2	3		3	8
情報処理職					2	2
技能職			14		12	26
技術職			7			7

新条件

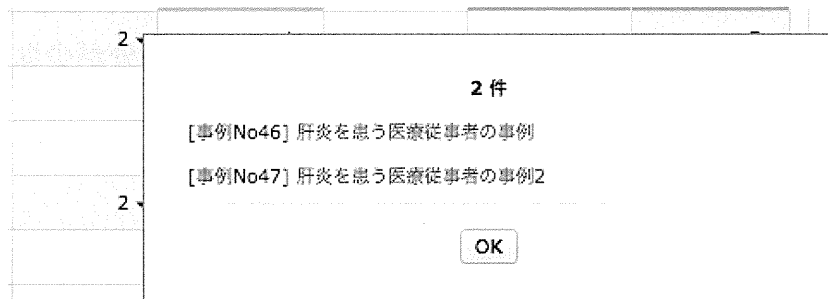
上の条件からドラッグして追加可能

The diagram shows a pivot table with a '新条件' (New Condition) button. Arrows indicate that conditions can be dragged from the filter list to the pivot table's columns (A) or rows (B). The pivot table below shows the result of adding a new condition:

職種コード	ウイルスの種類	B型肝炎ウイルス		C型肝炎ウイルス		Totals
		女性	男性	女性	男性	
その他			1		1	2
サービス職				1		1

列方向Aもしくは行方向Bの欄にグレーの項目枠をマウスのドラッグ操作により配置することができます。選択された項目で新たに表が作成されます。

上記図より、件数の数字横の▼をクリックした状態



ファイル構成

(トップディレクトリ)

pivot/	... 好事例集: 条件の組み合わせから検索
data_case.json	(組み合わせ検索用事例データ)
index.html	(表示用 HTML ファイル)
jquery-1.8.3.min.js	(Javascript プログラム用ライブラリ)
jquery-ui-1.9.2.custom.min.js	(同上)
pivot.css	(デザイン用 CSS ファイル)
pivot.js	(マウスアクション用 Javascript ファイル)

③スライド表示システム

パワーポイントで作成されたプレゼンテーションを Web で再現するものです。

主として CSS3 で作成されているためプログラムに依存する部分が少なく、比較的容易にメンテナンスができるようにしています。

労働者への配慮に関する意見調査

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

ウイルス性肝炎に罹患した労働者への 望ましい配慮に関する意見調査

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IV. 研究成果の刊行

Knowledge of HBV and HCV and Individuals' Attitudes Toward HBV- and HCV-Infected Colleagues: A National Cross-Sectional Study among a Working Population in Japan

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Abstract

Prejudice and discrimination in the workplace regarding the risk of transmission of Hepatitis B virus (HBV) and Hepatitis C virus (HCV) are increased by excess concerns due to a lack of relevant knowledge. Education to increase knowledge about HBV and HCV and their prevention could be the first step to reduce prejudice and discrimination. This study aimed to determine the association between the level of knowledge and negative attitudes toward HBV- and HCV-infected colleagues among the Japanese working population. An online anonymous nationwide survey involving about 3,000 individuals was conducted in Japan. The questionnaire consisted of knowledge of HBV and HCV, and attitudes toward HBV- and HCV-infected colleagues in the workplace. Knowledge was divided into three categories: "ensuring daily activities not to be infected"; "risk of infection"; and "characteristics of HBV/HCV hepatitis", based on the result of factor analysis. Multiple logistic regression analysis was applied. A total of 3,129 persons responded to the survey: 36.0% reported they worried about the possibility of transmission of HBV and HCV from infected colleagues; 32.1% avoided contact with infected colleagues; and 23.7% had prejudiced opinions about HBV and HCV infection. The participants were classified into tertiles. A higher level of knowledge of HBV and HCV was significantly associated with these three negative attitudes (P for trend < 0.005). This study suggests that increasing knowledge may decrease individuals' negative attitudes towards HBV- and HCV-infected colleagues. Thus, we should promote increased knowledge of HBV and HCV in stages to reduce negative attitudes toward HBV- and HCV-infected colleagues.

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Introduction

Although the risk of transmission of HBV and HCV through daily contact in the workplace is very low, many patients perceive prejudice and discrimination from acquaintances, family members, and even health care providers [1,2]. Fear of the possibility of transmission, where the perceived risk is often unnecessarily inflated, could also result in unnecessary changes in everyday practices [3]. For patients with HCV, the greatest concern was transmitting the virus to family members

[4]. Patients with emerging infectious diseases such as HIV and SARS face problems obtaining a job and perceive unfair treatment in the workplace [5,6]. In Japan, prejudice and discrimination in the workplace also result from the idea that infection with HBV and HCV is misunderstood to be similar to that of HIV [7].

Education to increase public knowledge of a specific disease is often the first step to reduce prejudice and discrimination [8,9]. Targeting inaccurate beliefs about viral hepatitis might improve public health interventions to foster healthier behavior

and better hepatitis outcomes [10]. Increasing knowledge of HBV and HCV is effective for preventing the acquisition and spread of infection [11-13]. However, reducing the stigma about HIV/AIDS and mental illness has not always yielded better outcomes [14], [15]. Educational efforts were effective in improving knowledge of HIV/AIDS transmission but these efforts did not convince the general public that HIV/AIDS could not be transmitted through casual contact [16].

It is reasonable to suggest that increasing knowledge of HBV and HCV might reduce negative attitudes towards HBV- and HCV-infected colleagues in the workplace. As far as we are aware, no studies have explored the association between knowledge of HBV and HCV and individuals' attitudes toward HBV- and HCV-infected colleagues in the workplace. Therefore, the aim of this study was to determine the association between higher levels of knowledge and negative attitudes toward HBV- and HCV-infected colleagues among the Japanese working population.

Materials and Methods

Participants and conduct of the survey

An online, anonymous, self-administered questionnaire was sent to 7,937 individuals in 47 prefectures of 10 areas in Japan in October 2011. Participants were selected randomly from volunteers registered with a survey company, using a stratified sampling method with sex and age. The sex ratio was 1:1, and there were equal numbers of participants in each group.

The cross-sectional survey comprised 28 questions ranging from participants' demographics (five items), to knowledge of essential factors concerning HBV and HCV (19 items), and general attitudes toward HBV- and HCV-infected colleagues (three items), accompanied by one question related to physical condition. Participants' demographics information comprised sex, age, educational level, occupation, and individual income.

Demographics and basic characteristics of participants

The demographics and basic characteristics of participants are shown in Table 1. Age was classified into five groups: 20–29, 30–39, 40–49, 50–59 and 60–69 years. Educational level was divided into three categories of lower than or equal to high school graduation; technical college or junior college; and higher than university. Occupation was classified into five groups: regular employee, non-regular employee, unemployed, others, and undergraduates. Others included agriculture, fishery, forestry, and self-employed business owners. Individual income was classified in three equal groups: low, <1 million yen (<12,500 US\$); middle, 1–3 million yen (12,500–37,500 US\$); and high, >3 million yen (>37,500 US\$) (1 US\$=80 yen). "Physical condition" was assessed by asking the following question, "How about your health status?" Responses were measured on a four-point scale (1 = very healthy; 2 = relatively healthy; 3 = relatively unhealthy; and 4 = unhealthy), and they were further dichotomized into "very healthy" and "relatively healthy" (= 1) and others (= 0).

Table 1. Demographics and basic characteristics of participants (n=3,129).

	n	(%)
Gender		
Male	1,549	(49.5)
Female	1,580	(50.5)
Age (yr)		
20-29	618	(19.8)
30-39	628	(20.1)
40-49	627	(20.0)
50-59	632	(20.2)
60-69	624	(19.9)
Education		
Junior high school or high school	693	(22.1)
Technical college or junior college	572	(18.3)
University and graduate school	1,864	(59.6)
Occupation		
Regular employee	1,076	(34.4)
Non-regular employee	540	(17.3)
Unemployed	1,010	(32.3)
Others	282	(9.0)
Undergraduate student	211	(6.7)
Healthy status		
Relatively healthy	2,627	(84.0)
Others	502	(16.0)
Individual income		
Low (<1 million yen/year)	1,236	(39.0)
Middle (1-3 million yen/year)	842	(26.6)
High (>3 million yen/year)	1,091	(34.4)
Attitude towards HBV/HCV infected colleagues		
Worrying about transmission		
Strongly agree and agree	1,125	(36.0)
Disagree and strongly disagree	2,004	(64.0)
Avoiding contact with infected colleagues		
Strongly agree and agree	1,003	(32.1)
Disagree and strongly disagree	2,126	(67.9)
Having prejudiced opinions about infected colleagues		
Strongly agree and agree	742	(23.7)
Disagree and strongly disagree	2,387	(76.3)

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Knowledge of HBV and HCV, and general attitudes toward HBV- and HCV-infected colleagues

Knowledge of HBV and HCV was investigated with 19 items that were developed from a discussion based on previous studies [8] [17,18]. Responses were measured on a two-point scale (0= No, I did not know, and 1= Yes, I knew). Table 2 shows each question. Cronbach α was calculated for each factor. We summed each factor, with the greater scores being indicative of having knowledge related to HBV or HCV. The participants were classified into tertiles (low, middle and high) according to the score for each category.

Table 2. Association of each negative attitude (n=3,129).

Worrying about transmission	Avoiding contact with infected colleagues	Having prejudiced opinions about infected colleagues	n	(%)
Strongly agree and agree	Strongly agree and agree	Strongly agree and agree	534	(17.1)
		Disagree and strongly disagree	336	(10.7)
	Disagree and strongly disagree	Strongly agree and agree	38	(1.2)
Disagree and strongly disagree	Strongly agree and agree	Disagree and strongly disagree	217	(6.9)
		Strongly agree and agree	52	(1.7)
	Disagree and strongly disagree	Disagree and strongly disagree	81	(2.6)
	Disagree and strongly disagree	Strongly agree and agree	118	(3.8)
		Disagree and strongly disagree	1753	(56.0)

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We used the following attitudes toward HBV and HCV infection as the outcome variables of the study: (1) "If I found that people with whom I work were infected with hepatitis virus, I would become anxious that I may be infected too" ("worrying about transmission"); (2) "If I found that people with whom I work were infected with hepatitis virus, I think I would try not to come in contact with him/her as much as possible" ("avoiding contact with infected colleagues"); and (3) "If I found that people with whom I work were infected with hepatitis virus, I think I would look at him/her erroneously with prejudice, suspecting him/her to be a homosexual, someone who engaged in sexual relationships with an unspecified number of people, or a drug addict" ("Having prejudiced opinions about infected colleagues"). Responses for all three outcomes were measured on a four-point scale (1= I think so; 2= I think so to a degree; 3= I do not really think so; and 4= I do not think so at all), and they were further dichotomized into "I think so" and "I think so to a degree" (=1) and the others (= 0).

Responses for all three outcomes were measured on a four-point scale (1= I think so; 2= I think so to a degree; 3= I do not really think so; and 4= I do not think so at all), and they were further dichotomized into "I think so" and "I think so to a degree" (=1) and the others (= 0).

Statistical analysis

We assessed factor structures of the three constructs using exploratory factor analysis, whereby all 19 items were entered using the maximum likelihood method. Factors were extracted using common-factors analysis, followed by promax rotation. We named each factor originally based on our discussion.

To explore associations between participants' knowledge of HBV and HCV and their attitudes toward HBV- and HCV-infected colleagues, each statement of opinion about infected colleagues was treated as a separated outcome. Multiple logistic regression analysis was used to determine the association between level of knowledge of HBV/HCV and the three negative attitudes towards HBV/HCV infected colleagues, where factors included in multivariate analysis were sex, age,

educational level, occupation, individual income, and health status. With respect to knowledge of HBV and HCV, the score for each domain was entered into the model. The outcome was not rare; therefore, we applied Zhang's formula [19].

Statistical analysis was performed using SPSS version 17.0 (IBM, Chicago, IL, USA). A two-tailed value of $P < 0.05$ was considered significant unless otherwise indicated.

Ethics

This survey was approved by the institutional ethics committee of Kitasato University School of Medicine. Response to the questionnaire was taken as agreement to participate in the study.

Results

Participant demographics and negative attitudes toward HBV and HCV infection

Our recruitment was terminated when the number of participants reached 3,129. Of the 3,129 respondents, 1,549 (49.5%) were male and each age group (20–29, 30–39, 40–49, 50–59, and 60–69 years old) contained approximately 20% of the total number of participants. The sample included 32.3% unemployed persons and 6.7% undergraduate students. Table 1 summarizes the characteristics of the study participants.

In terms of participants' negative attitudes towards HBV and HCV infection, 1,125 (36.0%) would worry about the possibility of transmission if they worked together with an infected colleague at the same workplace (worrying about transmission); 1,003 (32.1%) would avoid contact with HBV- and HCV-infected colleagues (avoiding contact with infected colleagues); and 742 (23.7%) would have a prejudiced opinion about their HBV- and HCV-infected colleagues (having prejudiced opinions about infected colleagues) (Table 1). "Disagree and strongly disagree" of all three negative attitudes was 56.0%; "Strongly agree and agree" of all three negative attitudes was 17.1% (Table 2).

Individuals' levels of knowledge about HBV and HCV

Table 3 shows the results of exploratory factor analyses. Three factors were extracted. Factor 1 consisted of six items regarding "ensuring daily activities not to be infected"; Factor 2 consisted of five items regarding "risk of infection"; and finally, Factor 3 consisted of eight items regarding "characteristics of hepatitis". Cronbach α coefficient was 0.93 for "ensuring daily activities not to be infected", 0.89 for "risk of infection", and 0.93 for "characteristics of viral hepatitis".

By univariate analysis, a high level knowledge of HBV and HCV for each category was significantly associated with worrying about transmission, avoiding contact with infected colleagues, and having a prejudiced opinion about infected colleagues. These associations remained after adjusting for potential confounders by multivariate analysis (Tables 4 and 5). Worrying about transmission was associated with knowledge of HBV and HCV: moderate level [adjusted odds ratio (OR) "ensuring daily activities not to be infected", "risk of infection", and "characteristics of viral hepatitis": 0.74, 0.91, 0.92; 95%

Table 3. Exploratory factor analysis of 19 items of the questions about hepatitis virus using the maximum likelihood method and Promax rotation (n=3,124).

Items:	Answer (%)		Factor 1	Factor 2	Factor 3	Category name	Cronbach's α
	Yes	No					
HBV/HCV not transmitted even if you share the same tableware with someone who is infected	60.4	29.6	-0.126	0.057	0.910	Ensuring daily activities not to be infected	0.93
HBV/HCV not transmitted even if you lightly kiss someone who is infected	45.2	54.8	-0.217	0.167	0.750		
HBV/HCV not transmitted even if you use the same bath, such as a hot spring, with someone who is infected	62.1	37.9	0.017	0.091	0.769		
HBV/HCV not transmitted even if you talk with someone who is infected	76.6	23.5	0.385	-0.111	0.642		
HBV/HCV not transmitted even if you work with someone who is infected	76.6	23.4	0.412	-0.108	0.624		
HBV/HCV not transmitted even if you shake hands with someone who is infected	76.7	23.3	0.411	-0.113	0.606		
HBV/HCV spread via the blood and body fluids of infected persons	77.6	22.2	0.918	-0.007	-0.097	Risk of infection	0.88
Blood tests can tell you if you are infected with HBV/HCV	77.6	22.4	0.812	0.036	-0.026		
Those who have received a blood transfusion or blood preparations in the past may be infected with HBV/HCV	78.4	21.6	0.784	0.068	-0.075		
HBV/HCV may be transmitted if you share a razor, pierced earrings, a syringe, etc., with someone who is infected	71.6	28.4	0.737	-0.001	0.026		
HBV/HCV may be transmitted if you have sexual intercourse with someone who is infected.	63.7	36.3	0.628	0.048	0.025		
HBV/HCV is more often the cause of hepatic cirrhosis than drinking alcohol; it accounts for roughly 65% of cases	21.3	78.7	-0.106	0.777	0.050	Characteristics of HBV/HCV hepatitis	0.86
HBV/HCV is the cause of liver cancer in approximately 90% of cases	16.6	83.5	-0.141	0.760	0.062		
Some people who are persistently infected with HBV/HCV may develop hepatic cirrhosis or liver cancer at age 40–60 years	39.7	60.3	0.126	0.631	0.044		
Even though the results of a liver function test produced no abnormal results, you may be persistently infected with HBV/HCV	29.0	71.0	0.076	0.630	0.009		
By having hepatitis B or C adequately treated, you may be able to completely cure it, or delay the advancement of cirrhosis or liver cancer	39.1	60.9	0.164	0.625	0.021		
1 in 50 Japanese people aged 15–59 years are assumed to be persistently infected with HBV/HCV	12.0	88.0	-0.110	0.594	0.051		
Even though you may not have any special subjective symptoms, you may be persistently infected with HBV/HCV	46.9	53.1	0.283	0.534	-0.033		
Patients infected with hepatitis virus may need to discontinue work to undergo treatment	42.8	57.2	0.267	0.459	-0.065		
Variance explained (%)			42.9	10.8	4.8		

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confidence interval (CI): 0.66–0.81, 0.83–1.00, and 0.85–0.99; and high level (OR: 0.60, 0.82, and 0.80; 95%CI: 0.54–0.66, 0.75–0.89, and 0.73–0.86). Avoiding contact with infected colleagues was associated with knowledge of HBV and HCV: moderate level (OR: 0.76, 0.76, and 0.88; 95% CI: 0.69–0.83, 0.68–0.83, and 0.81–0.94); and high level (OR: 0.64, 0.54, and 0.79; 95% CI: 0.58–0.70, 0.49–0.60, and 0.73–0.85). Having prejudiced opinions about infected colleagues was associated with knowledge of HBV and HCV: moderate level (OR: 0.90, 0.96, and 0.93; 95% CI: 0.84–0.96, 0.89–1.01, and 0.88–0.98); and high level (OR: 0.87, 0.92, and 0.89; 95% CI: 0.81–0.91, 0.87–0.97, and 0.83–0.94). A higher level of knowledge of HBV and HCV was significantly associated with these three negative attitudes (P for trend < 0.005).

Discussion

This study aimed to evaluate the association between level of knowledge of HBV and HCV and individuals' negative attitudes toward HBV- and HCV-infected colleagues in the workplace in Japan. We hypothesized that a high level of knowledge of HBV and HCV would be associated with decreasing negative attitudes toward HBV- and HCV-infected colleagues. Our study showed that increasing knowledge of HBV and HCV in each of three categories was associated with decreasing negative attitudes towards HBV- and HCV-infected colleagues.

The level of HBV/HCV knowledge in the Japanese working population was acceptable and in the present study, it was almost the same as in a previous studies of Australian and Chinese health professionals [2] and higher than in the general

Table 4. Demographics of each negative attitude and each knowledge about HBV and HCV.

	n=9,129 (% ^a)		Avoiding contact with infected colleagues		Having prejudiced opinions about infected colleagues	
	Worrying about transmission		colleagues		colleagues	
	n=1,126 (% ^b)	n=1,008 (% ^b)	n=742 (% ^b)			
Ensuring daily activities not to be infected						
Low (0-3)	685 (21.9)	311 (45.4)	279 (40.7)	198 (28.9)		
Moderate (4-5)	764 (24.4)	294 (38.5)	253 (33.1)	183 (24.0)		
High (6)	1680 (53.7)	520 (31.0)	471 (28.0)	361 (21.5)		
Risk of infection						
Low (0-2)	1,083 (34.6)	475 (43.9)	441 (40.7)	314 (29.0)		
Moderate (3-4)	1,038 (33.2)	388 (37.4)	327 (31.5)	240 (23.1)		
High (5)	1,008 (32.2)	252 (26.0)	235 (23.3)	188 (18.7)		
Characteristics of HBV/HCV hepatitis						
Low (0)	1,027 (32.8)	555 (54.0)	502 (48.9)	318 (31.0)		
Moderate (1-3)	747 (23.9)	273 (36.5)	237 (31.7)	163 (21.8)		
High (4-8)	1,355 (43.3)	297 (21.9)	264 (19.5)	251 (19.3)		

^a The percentage indicates the number of each tertiles (low, moderate, high) divided by total number (9,129)
^b The percentage indicates the number of "yes" answers divided by total number of each tertiles (low, moderate, high)
 HBV, Hepatitis B virus; HCV, Hepatitis C virus.
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population [10-12,17,18]. This result indicated that Japanese working population had a relatively high knowledge of HBV/HCV hepatitis.

Knowledge of HBV/HCV was divided into three categories: "Ensuring daily activities not to be infected", "Risk of infection" and "Characteristics of HBV/HCV hepatitis". The level of knowledge of "Characteristics of HBV/HCV hepatitis" was lower than the level of knowledge about "Risk of infection" and "Ensuring daily activities not to be infected". Knowledge of "Characteristics of HBV/HCV hepatitis", especially "HBV/HCV is the cause of liver cancer in approximately 90% of cases" and "by having hepatitis B or C adequately treated, you may be able to completely cure it, or delay the advancement of cirrhosis or liver" was relatively low. This result is consistent with previous studies [10,11]. The level of knowledge regarding treatment and prognosis of HIV/AIDS was higher than the level of knowledge of HCV [10]. Education to improve knowledge regarding infectious transmission and preventive measures as well as characteristics of hepatitis such as prognosis and treatment should be implemented.

Although HBV/HCV cannot be transmitted through casual contact in the workplace, 20% to 40% of participants had a negative attitude toward HBV/HCV-infected colleagues, 56% of participants did not have all three negative attitudes, and 17% of participants had all three negative attitudes. Negative

attitudes towards HBV and HCV infection were evaluated by three items such as "worrying about transmission" (awareness), "avoiding contact with infected colleagues" (behavior) and "having prejudiced opinions about infected colleagues" (discrimination). The percentages of each item were "awareness" (38.0%), "behavior" (32.1%) and "discrimination" (23.7%). In a previous study of HIV/AIDS, "awareness" was more difficult to improve by education compared with other negative attitudes [8]. This may be influenced by inflating the risk of transmission [3]. It might suggest that decreasing negative attitude may be in order of "discrimination", "behavior", and "awareness".

Increasing the level of knowledge regarding HBV/HCV was associated with decreasing negative attitudes towards HBV/HCV-infected colleagues in the workplace. Community-based studies suggest that increasing the level of knowledge of HIV/AIDS and tuberculosis by education leads to a decrease in negative attitudes towards infected patients [16,20,21]. However, even health care professionals with high levels of knowledge regarding HBV/HCV showed discrimination towards hepatitis patients. People living with HIV/AIDS are subjected to stigma, which is significantly associated with organizational cynicism [22]. Thus, both education that provident knowledge and problem solving, learning and interactive educational sessions are recommended [2]. A multidimensional educational approach to increase the awareness of HBV/HCV may be needed in the workplace.

The strength of the present study was that it involved a large sample of more than 3,000 participants from all regions of Japan. Furthermore, the participants had different professions and included homemakers, who are common in Japan, which enabled a wide generalization of the findings. There were some limitations of the study. Our study population presumably had internet access and therefore might have been more aware of HBV and HCV through access to online information [23]. Our study population was educated to a higher level (60% of subjects were university and graduate school) than the general Japanese working population. The study was cross-sectional; therefore, no causal relationship could be concluded from the findings. To clarify the causal relationship between knowledge of HBV/HCV and negative attitudes, an interventional study should be conducted in the future. Although HBV and HCV have different disease characteristics with different dominant modes of transmission and different types and goals of therapy, we did not measure knowledge of HBV and HCV separately. Furthermore, although knowledge of HBV and HCV were probable contributors to attitudes towards HBV- and HCV-infected colleagues, factors influencing their level of knowledge remain unknown. In addition, only some indicators of knowledge regarding HBV and HCV and attitudes towards HBV- and HCV-infected colleagues were investigated.

Conclusion

This study suggests that increasing knowledge may improve individuals' negative attitudes towards HBV- and HCV-infected colleagues. We should promote increased knowledge of HBV

Table 5. Univariate and multivariate analyses of association between each domain of HBV/HCV knowledge and attitudes toward HBV/HCV infection (n=3,129).

Odds ratio (95% confidence interval)							
		Worrying about transmission		Avoiding contact with infected colleagues		Having prejudiced opinions about infected colleagues	
		Univariate model	Multivariate model ^a	Univariate model	Multivariate model ^a	Univariate model	Multivariate model ^{a,b}
Ensuring daily activities not to be infected							
Low ^c	(0-3)	ref	ref	ref	ref	ref	ref
Moderate	(4-5)	0.72 (0.66-0.80)	0.74 (0.66-0.81)	0.75 (0.68-0.82)	0.76 (0.69-0.83)	0.88 (0.82-0.94)	0.90 (0.84-0.96)
High	(6)	0.59 (0.53-0.65)	0.60 (0.54-0.66)	0.63 (0.58-0.69)	0.64 (0.58-0.70)	0.85 (0.80-0.90)	0.87 (0.81-0.91)
Test for linear trend ^d		p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001
Risk of infection							
Low ^c	(0-2)	ref	ref	ref	ref	ref	ref
Moderate	(3-4)	0.89 (0.80-0.97)	0.91 (0.83-1.00)	0.89 (0.81-0.96)	0.76 (0.68-0.83)	0.93 (0.87-0.99)	0.95 (0.89-1.01)
High	(5)	0.79 (0.72-0.86)	0.82 (0.75-0.89)	0.82 (0.76-0.88)	0.64 (0.48-0.80)	0.91 (0.85-0.96)	0.92 (0.87-0.97)
Test for linear trend ^d		p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.002
Characteristics of HBV/HCV hepatitis							
Low ^c	(0)	ref	ref	ref	ref	ref	ref
Moderate	(1-3)	0.72 (0.66-0.80)	0.92 (0.85-0.99)	0.87 (0.80-0.93)	0.88 (0.81-0.94)	0.92 (0.87-0.97)	0.93 (0.88-0.98)
High	(4-6)	0.59 (0.53-0.65)	0.80 (0.73-0.86)	0.77 (0.71-0.83)	0.79 (0.73-0.85)	0.87 (0.82-0.92)	0.89 (0.83-0.94)
Test for linear trend ^d		p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001

^a Each domain was entered into multivariate model separately
^b Adjusted for sex, age, education, occupation, healthy status, individual income
^c Reference category
^d Test for linear trends were performed by modeling the group scores of HBV/HCV knowledge (1, 2, 3) as one variable
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and HCV in stages to reduce negative attitudes towards HBV- and HCV-infected colleagues.

Contributed reagents/materials/analysis tools: HE KW. Wrote the manuscript: HE KW.

Author Contributions

Conceived and designed the experiments: KW HE. Performed the experiments: KW HE. Analyzed the data: HE KW.

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Field Study

Hepatitis Screening in Japanese Individuals of Working Age and Prejudice against Infected Persons in the Workplace

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Abstract: Hepatitis Screening in Japanese Individuals of Working Age and Prejudice against Infected Persons in the Workplace: Nanae SASAKI, et al. Health Promotion Center Shonan Area, Komatsu Ltd.—**Background:** Laboratory confirmation of viral hepatitis infection represents an important issue for working age populations, as early detection and treatment can help ameliorate clinical progression of the disease. On the other hand, prejudice may occur in the workplace against those identified by a positive hepatitis test. This study investigated attitudes towards viral hepatitis testing in Japanese people of working age, including their desire to undergo such testing, and prejudice against persons infected with hepatitis virus. **Methods:** A total of 3,129 working age individuals were recruited from a company that conducts Internet surveys in Japan. **Results:** Of the respondents, 21.3% had previously undergone viral hepatitis testing, most frequently when it was an additional option during a health checkup or health screening for local residents (36.2%) and when it was included in regular health checkups in their workplace (19.2%). Among the respondents with no history of testing, 68.7% expressed a desire to undergo testing, of whom 74.8% wanted to have the test as part of their regular health checkups in the workplace. According to the respondents, if a coworker tested positive for hepatitis, 36.0% reported that they would be anxious about it, 32.0% would try to avoid contact with the infected person as long as circumstances permitted, and 23.7% said they might harbor some kind of bias. **Conclusions:** Although further promotion of viral hepatitis testing is needed and this might be achieved during regular health checkups in

Japanese workplaces, educational strategies will also be essential to help reduce bias against those who test positive.

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Key words: Hepatitis B, Hepatitis C, Japan, Testing, Workers

Progression of viral hepatitis to liver cirrhosis and liver cancer can be prevented by treatment, especially if the infection is identified at an early stage^{1,2)}. In Japan, the *Basic Act on Hepatitis Measures* was enacted in 2009 and has been facilitating a project to provide opportunities for viral hepatitis screening³⁾. However, because most hepatitis virus carriers are asymptomatic, they are not likely to be self-motivated to undergo viral hepatitis testing^{4,5)}, and it remains unclear what proportion of the working generation population has already undergone such testing in Japan. The prevalence of hepatitis B surface (HBs) antigen-positive and hepatitis C virus (HCV) antibody-positive Japanese individuals has been shown to increase with age until 69 years^{6,7)}. According to a survey of 3,740,000 people who donated blood between 2001 and 2006, the prevalence of hepatitis C antibody was lowest (0.06%) in blood donors aged 20–24 years and highest (1.08%) among those aged 65–69 years. The prevalence of HBs antigen in the same study was lowest (0.15%) in those aged 20–24 years, and highest (1.36%) in those aged 55–59 years.

The Japanese Ministry of Health, Labour and Welfare has requested that companies add viral hepatitis testing to blood examinations conducted as part of routine health checkups held in the workplace⁸⁾. Business owners are obligated by the *Occupational Health and Safety Law* to provide health checkups including blood screening to their employees who

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are 35 years of age and to those in their 40s or older once per year. If viral hepatitis testing was included in such health checkups, employees could be examined for this disease without the need for additional, invasive tests⁹⁾. However, there are issues regarding who would bear the cost, privacy concerns when handling test results in the workplace and how to deal with employees who simply do not want the test¹⁰⁾.

It is extremely rare for viral hepatitis to be transmitted between individuals who are working together in an ordinary (nonmedical) workplace^{11,12)}. However, there is often a general anxiety among workers about the risk of cross-infection from coworkers. Given the well-known routes of transmission of viral hepatitis including homosexual intercourse and the use of injected drugs^{13,14)}, infected persons may be confronted with anxiety and biases from surrounding people. This may unduly inhibit infected persons from continuing with their work, as well as interfere with the promotion of viral hepatitis testing^{15,16)}. The implementation of measures to eliminate anxiety and prejudice toward infected persons while promoting screening opportunities for hepatitis viruses in the working generation must, therefore, be given high priority. The purpose of this study was to clarify the viral hepatitis screening status of people in the working generation, their desire to undergo such screening and prejudice toward coworkers who might test positive for hepatitis.

Materials and Methods

Recruitment of participants

Around 3,000 individuals of working age (between 20 and 69 years of age), without gender or age bias, were randomly extracted from the registry of an Internet research company (among a randomly selected group of 7,937 persons in the total 1.60 million registrants), and a survey of this study population was then carried out via the Internet in September 2011. People who were interested in a survey with financial incentives for responding voluntarily registered. The web survey company contacted selected registrants to respond to the survey and ceased recruitment when the total number of participants reached the target number. Participants were recruited in clusters, targeting 300 individuals for each gender in each age group. Persons working as or living with family members who were medical professionals (doctors, nurses, pharmacists) or working in occupations in industries pertaining to medicines and health foods, health care and welfare services were excluded from the study. This study was approved by the Kitasato University School of Medicine Ethics Committee prior to implementation.

Questionnaire

The question about the opportunity to undergo viral hepatitis testing, i.e., "Have you had at least one blood test for hepatitis B or C virus screening?" was to be answered with "Yes", "No" or "Unclear." Questions regarding the desire to undergo viral hepatitis screening, "Do you want to have viral hepatitis screening if it is free of charge?" and "Do you want to have a blood test for viral hepatitis screening as part of a health checkup in the workplace if it is free of charge?" were answered as "Yes, definitely", "Probably", "Probably not" and "Definitely not". These questions were not asked of participants who had already undergone viral hepatitis screening (as indicated on their questionnaire). Questions about the recognition of hepatitis patients included "Would you be anxious about possibly becoming infected from a coworker who carries the hepatitis virus?" "Would you avoid contact with a coworker who is infected with a hepatitis virus as far as possible?" and "Would you be biased against a coworker who is infected with a hepatitis virus, suspecting that the coworker may be a homosexual or a drug user or that they have multiple sexual partners?" The options for answers to these questions were also "Yes, definitely", "Probably", "Probably not" or "Definitely not".

Individuals who had previously undergone viral hepatitis testing were asked about the reasons for being tested and were required to choose at least one of the following 13 answers: 1) Viral hepatitis testing was an additional option as part of a complete health checkup or health screening for local residents; 2) Viral hepatitis testing was included in regular health checkups implemented in the workplace; 3) Viral hepatitis testing was included in pregnancy health checkups or medical examinations at the time of surgery in a hospital; 4) My doctor recommended it; 5) I donated blood; 6) A health screening examination found an abnormality in my liver function; 7) One of the persons around me was infected with a hepatitis virus or had hepatitis, hepatic cirrhosis or liver cancer; 8) A medical examination other than a regular health checkup found an abnormality in my liver function; 9) There was a possibility that I was given a blood transfusion or blood product in the past; 10) Publicity of the Ministry of Health, Labour and Welfare or a news report motivated me to be tested; 11) My family or an associate recommended it; 12) I am/was engaged in handling of blood products (for example, for experiments, research and development, nursing care); 13) I had suggestive symptoms.

Results

Completed responses to the questionnaire were obtained from 3,129 individuals. Table 1 shows the

Table 1. Participant characteristics

	Total	
	N=3,129	(%)
Gender		
Male	1,572	(50.2)
Female	1,557	(49.8)
Age (yr)		
20–29	618	(19.8)
30–39	628	(20.1)
40–49	627	(20.0)
50–59	632	(20.2)
60–69	624	(19.9)
History of viral hepatitis testing		
Yes	668	(21.3)
No	2,062	(65.9)
Unclear	399	(12.8)
Do you want to have viral hepatitis screening if it is free of charge?		
Yes, definitely	674	(21.5)
Probably	1,043	(33.3)
Probably not	565	(18.1)
Definitely not	179	(5.7)
Already tested	668	(21.3)
Do you want hepatitis screening as part of a workplace health checkup if it is free of charge?		
Yes, definitely	866	(27.7)
Probably	982	(31.3)
Probably not	426	(13.6)
Definitely not	187	(6.0)
Already tested	668	(21.3)
Would you be anxious about possibly becoming infected from a coworker who carries the hepatitis virus?		
Yes, definitely	284	(9.1)
Probably	841	(26.9)
Probably not	1,323	(42.3)
Definitely not	681	(21.8)
Would you avoid contact with a coworker who is infected with a hepatitis virus as far as possible?		
Yes, definitely	211	(6.7)
Probably	792	(25.3)
Probably not	1,356	(43.3)
Definitely not	770	(24.6)
Would you be biased against a coworker who is infected with a hepatitis virus, suspecting that the coworker may be a homosexual or a drug user or that they have multiple sexual partners?		
Yes, definitely	114	(3.6)
Probably	628	(20.1)
Probably not	1,386	(44.3)
Definitely not	1,001	(32.0)

characteristic of the participants. A history of hepatitis B or C viral screening was present in 21.3% of respondents (28.7% of those aged 40 to 69 years), absent in 65.9% and unclear in 12.8%.

The most frequent reason for having undergone viral hepatitis testing was that "viral hepatitis testing was an additional option as part of a complete health checkup or health screening for local residents" (36.2%), followed by "viral hepatitis testing was included in regular health checkups implemented in the workplace" (19.2%) and "viral hepatitis testing was included in pregnancy health checkups or medical examinations at the time of surgery in a hospital" (15.4%) (Table 2). Individuals wanting hepatitis screening, if it was free of charge, accounted for 54.8% of respondents ("Yes, definitely" and "Probably"). Those who wanted to have viral screening, if it was free of charge and included in regular health checkups in the workplace, accounted for 59.0% of respondents ("Yes, definitely" and "Probably"). Among respondents with no history of testing, 68.7% expressed a desire to undergo testing, of whom 74.8% wanted to have the test as part of their regular health checkups in the workplace.

Concerning the recognition of infected persons, 9.1 and 26.9% of respondents answered "Yes, definitely" and "Probably", respectively, to the question as to whether they would be anxious about becoming infected if they found out that a coworker was infected with a hepatitis virus (Table 1). The percentage of respondents who would avoid contact with an infected person as far as possible was 6.7%, and the percentage of those who would probably do so was 25.3%. In addition, 3.6% of respondents reported that they would suspect infected persons of being homosexuals or drug users or having multiple sexual partners, and 20.1% reported that they would probably do so.

Discussion

We investigated the current status of viral hepatitis screening and attitudes among Japanese of working age, including their desire to have viral hepatitis screening and their anxiety and prejudice toward coworkers infected with hepatitis viruses. In this study, around one-fifth of respondents had previously undergone viral hepatitis testing. If the test was free of charge, 54.8% of respondents wished to have the test. In addition, a higher proportion (59.0%) of respondents wished to have viral testing during their regular health checkups in the workplace if it was free of charge. On the other hand, 32 to 36% of respondents said they would have anxiety or biases regarding the risk of infection from a coworker if a coworker had tested positive for viral hepatitis. About 24% of respondents harbored biases toward infected coworkers, suspecting that they might be homosexu-

Table 2. Reasons for having blood screening for viral hepatitis (multiple selections allowed)

	Total		20–39 years		40–69 years	
	N=668	(%)	n=128	(%)	n=540	(%)
Viral hepatitis testing was an additional option as part of a complete health checkup or health screening for local residents.	242	(36.2)	20	(15.6)	222	(41.1)
Viral hepatitis testing was included in regular health checkups implemented in the workplace.	128	(19.2)	30	(23.4)	98	(18.1)
Viral hepatitis testing was included in pregnancy health checkups or medical examinations at the time of surgery in a hospital.	103	(15.4)	35	(27.3)	68	(12.6)
My doctor recommended it.	44	(6.6)	9	(7.0)	35	(6.5)
I donated blood.	41	(6.1)	11	(8.6)	30	(5.6)
A health screening examination found an abnormality in my liver function.	36	(5.4)	10	(7.8)	26	(4.8)
One of the persons around me was infected with a hepatitis virus or had hepatitis, hepatic cirrhosis, or liver cancer.	26	(3.9)	5	(3.9)	21	(3.9)
A medical examination other than a regular health checkup found an abnormality in my liver function.	22	(3.3)	5	(3.9)	17	(3.1)
There was a possibility that I was given a blood transfusion or blood product in the past.	21	(3.1)	1	(0.8)	20	(3.7)
Publicity of the Ministry of Health, Labour and Welfare or a news report motivated me to be tested.	21	(3.1)	0	0.0	21	(3.9)
My family or an associate recommended it.	19	(2.8)	6	(4.7)	13	(2.4)
I am/was engaged in handling of blood products.	19	(2.8)	11	(8.6)	8	(1.5)
I had suggestive symptoms.	12	(1.8)	2	(1.6)	10	(1.9)

als or drug users or have multiple sexual partners. Although provision of viral hepatitis testing as part of regular health checkups in the workplace should be considered for the promotion of viral hepatitis screening, this would clearly need to be implemented with a significant privacy protection when handling test results. Furthermore, the dissemination of accurate knowledge concerning the disease such as the limited risk of infection with viral hepatitis at workplaces and standard precautions in order to prevent infection would also be needed.

In Japan, the government recommends that all people aged 20 years or older undergo viral hepatitis testing at least once in their lifetimes¹⁹. However, the actual percentage of those who have actually received viral hepatitis testing has been shown to be only 21.3%. Although the government has suggested comprehensive urgent countermeasures against hepatitis C, such as the recommendation in 2002 of viral hepatitis testing for all people age 40 years or older, the percentage of participants in this study who were 40 to 69 years of age and who had undergone viral testing was only 28.7%. In comparison, a free hepatitis B testing campaign was previously carried out for Asian people living in San Francisco and found high anti-hepatitis B awareness in this population, with a testing rate of 60%¹⁷. In Japan, opportunities

for viral hepatitis testing are provided through various channels, including viral hepatitis tests that have been added to blood examinations at regular health checkups in the workplace, free testing in public health centers, free testing in designated medical institutions, and health screening for local residents. In this regard, advancing knowledge and conveying an effective message regarding the benefits of screening are clearly required¹².

In the current study, 12.8% of participants said they were not sure whether or not they had previously undergone viral hepatitis testing (Table 1). This suggests that not only is the implementation of viral hepatitis testing important, but also that appropriate reporting of test results be made to the person who was tested. It is possible that those who were tested were not informed of their results or that they did not have adequate knowledge to understand the test results even if they had been informed¹⁸. Therefore, dissemination of knowledge about viral hepatitis to the general public remains an important issue, together with the more widespread implementation of testing. Aside from being tested and vaccinated themselves¹⁹, health-care professionals should also make greater efforts to explain test results to patients and standard precautions at workplaces. This would allow individuals who tested either positive or negative to more

clearly understand their results, even if their test had been implemented as one of many clinical examinations conducted during pregnancy health checkups or medical examinations at the time of surgery¹².

In working-age populations, the proportion of individuals who wanted viral hepatitis testing (without personal expense) as part of their regular health checkups in the workplace was higher than the proportion of those who wanted to have the testing if it was simply free of charge. This suggests that the testing rate increases among people of working age if easy access to free-of-charge viral hepatitis tests is provided during opportunities such as regular health checkups in the workplace. On the other hand, a certain proportion of people in the current study reported that they did not want to be tested ("Probably not" and "Definitely not"), accounting for 24% of untested participants (Table 1). Along with the dissemination of knowledge about hepatitis itself, this result suggests that it is also important to provide a full explanation of the privacy protection policy in the handling of test results when implementing viral hepatitis testing in the workplace²⁰.

Excluding those who handle blood products as part of their occupation, the risk of hepatitis virus infection is extremely low in ordinary workplaces. It is entirely inappropriate for persons infected with hepatitis to be treated in a discriminatory manner or subjected to any kind of prejudice²¹. In this study, 20–30% of participants reported anxiety about becoming infected from coworkers who had tested positive for hepatitis, agreeing that they might have discriminatory views toward infected coworkers (Table 1). If viral hepatitis testing is implemented in Japanese workplaces, significant efforts aimed at privacy protection and due consideration regarding the method of disseminating accurate and detailed knowledge are clearly necessary, and should be based on the fact that anxiety and prejudice do still exist among some individuals.

This study has a limitation that is worth considering. Because the subjects we recruited had access to the Internet and volunteered to participate in the survey, there may have been a certain degree of selection bias. Considering social stratification, the percentage of people who had a history of viral hepatitis testing in this study might have been higher than that in the general working generation population²².

In conclusion, this study suggests that further promotion of viral hepatitis testing is needed in Japan and that greater opportunities for such testing need to be provided in the workplace. On the other hand, a certain proportion of workers said they might harbor anxiety and prejudice toward coworkers who tested positive for viral hepatitis even though the risk of workplace transmission is very low. Any such test

results would therefore need to be subject to the utmost confidentiality, while the dissemination of accurate knowledge is also necessary to ensure that infected persons and those around them are able to work in a setting free of misguided anxiety.

Conflict of interests: None to declare.

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V. 公開講座案内

職場における これからの肝炎対策

対 象 企業の衛生管理者/看護師・保健師/産業医

プログラム

■ 15:30 - 16:00

渡辺 哲 東海大学医学部 公衆衛生学 教授

「職場における肝疾患の健康管理」

■ 16:00 - 16:30

堀江 正知 産業医科大学 産業生態科学研究所 教授

「ウイルス性肝炎に罹患した労働者の就業上の配慮」

■ 16:30 - 16:45 コーヒーブレイク

■ 16:45 - 18:00

泉 並木 武蔵野赤十字病院 副院長

特別講演「ウイルス性肝炎の現況と最新の治療」

平成24年 **3月8日** (木) 15:30~18:00 (15:00開場)

都市センターホテル 5階会議室 オリオン

〒102-0093 東京都千代田区平河町2-4-1 TEL 03-3265-8211 <http://toshicenter.co.jp/>

参加申込
参加無料・要事前申込

会場の都合のため事前申込をお願いします。参加者氏名・御所属・職業・FAX番号を記入の上、2月20日までにFAX(0463-92-3549)で御申込み下さい。

本公開講座は、平成23年度厚生労働科学研究費(難病・がん等の疾患分野の医療の実用化研究事業)「職域における慢性ウイルス性肝炎患者の実態調査とそれに基づく望ましい配慮の在り方に関する研究」による事業の一環として実施するものです。



平成24年度 厚生労働科学補助金 研究事業 公開講座

職場健診でよく見られる 肝疾患とその対策

対象 企業の産業医 / 看護師・保健師 / 衛生管理者

座長 渡辺 哲(東海大学医学部 公衆衛生学 教授)

13:00~13:45

渡辺 勲史(東海大学医学部消化器内科学教授 付属八王子病院副院長)
「ウイルス性肝炎の現状と治療」

13:45~14:30

橋本 悦子(東京女子医科大学消化器内科教授)
「メタボリック症候群の肝病変
非アルコール性脂肪肝(NAFLD)その診断と治療」

～休憩～

14:40~15:25

丸山 勝也(国立病院機構 久里浜医療センター名誉院長)
「職場におけるアルコール関連問題－肝疾患を中心に－」

平成25年

1月10日

会場

学術総合センター2階 一橋記念講堂

TEL 03-4212-3900

〒101-8439 東京都千代田区一ツ橋 2-1-2 学術総合センター 2F

<http://www.hit-u.ac.jp/guide/other/hall.html>

12:50~16:00 (12:15 開場)

参加申込

会場の都合のため事前申込をお願いします。定員に達し次第申込み終了とさせていただきます。申込専用ホームページ(<http://kanen.med.u-tokai.ac.jp/>)から12月28日までにお申込み下さい。

参加無料・
要事前申込
(定員300名)

本公開講座は、平成24年度厚生労働科学研究費(難病・がん等の疾患分野の医療の実用化研究事業)「職域における慢性ウイルス性肝炎患者の実態調査とそれに基づく望ましい配慮の在り方に関する研究」による事業の一環として実施するものです。


TOKAI
UNIVERSITY