

Original Article

Nutrition education in medical schools in Japan: results from a questionnaire survey

Hideo Orimo MD, PhD¹, Toshiro Shimura MD, PhD² and Takashi Shimada MD, PhD¹

¹Department of Biochemistry and Molecular Biology, Nippon Medical School

²Center for Educational Development, Nippon Medical School

Diet is known to play a critical role in the pathogenesis of major age-related chronic diseases, which are rapidly becoming more common in Japan and other industrialized countries. However, traditional medical education has not provided adequate knowledge of nutrition. To understand the current status of nutrition education in Japan, we sent a questionnaire to all Japanese medical schools to survey their nutrition curricula. The questionnaire was sent to 79 medical schools in Japan, which includes all medical schools except for that of the authors. We also used a questionnaire to survey second year medical students just after they received a short nutrition course at Nippon Medical School. Fifty-seven medical schools (72.2%) responded to the questionnaire: 12 (21.1% of the responding schools) offered a "nutrition" course and 3 (5.4%) offered a "clinical nutrition" course. Including "nutrition" and "clinical nutrition" courses, 14 of the responding medical schools (24.6%) offered stand-alone nutrition courses in their undergraduate education. Although a total of 48 of the responding medical schools (84.2%) offered some nutrition topics, only 8 of the responding schools (14.0%) may have offered substantial nutrition education. No special postgraduate course in medical or clinical nutrition was offered by any of the schools. Despite this, more than 80% of the students that appeared to be interested in a nutrition course recognized the importance of nutrition education in medical school. This survey showed that nutrition education in Japanese medical schools remains inadequate and changes are necessary.

Key Words: nutrition education, medical schools, Japan, questionnaire, curriculum

Introduction

Diet is known to play a critical role in the pathogenesis of major age-related chronic diseases, which are rapidly becoming more common in Japan and other industrialized countries. To prevent and care for these chronic diseases, nutritional knowledge is essential for health professionals including physicians. However, traditional medical education has not provided adequate knowledge of nutrition. Even in the "model core-curriculum for medical education",¹ which provides a national standard curriculum guideline for Japanese medical schools, nutrition is not treated as an essential course. According to a survey performed in 1997, only 12.9% of the medical schools in Japan offered stand-alone nutrition courses during undergraduate education.² In contrast, during the last few years, new educational programs such as the "Nutrition Academic Award Program", have been conducted in the United States.³ We therefore carried out a new survey to determine the current status of nutrition education in Japanese medical schools.

Subjects and methods

A questionnaire (Table 1) was sent to the deans of 79 medical schools in Japan in March 2004. This includes all medical schools except for Nippon Medical School to which the authors belong. The questionnaire was designed to compare with the former questionnaire survey by Watanabe and Saito.² By May 13, 45 of the medical schools

responded. We sent a letter of reminder to 34 of the medical schools, and 23 of them responded by the end of June. Together, 57 of the medical schools (72.2%) responded. We also used a questionnaire (Table 2) in February 2004 and February 2005 to survey second year students who had just received a 4-h (2004) and 3-h (2005; because of a national holiday) nutrition course at Nippon Medical School.

Results

The survey was performed in 79 medical schools in Japan, 57 of which responded. Of these 57 responding schools, 30 were national schools (69.8% of a total of 43 national schools), 4 were municipal schools (50% of 8 municipal schools), and 23 were private schools (82.1% of 28 private schools except for Nippon Medical School). Of the 57 responding schools, 12 (21.1%) indicated that they offered a nutrition course and 3 (5.4%) offered a clinical nutrition course. These "nutrition" courses included a "biochemistry and nutrition" course, a "nutrition and gene therapy" course, and a "biochemistry" course. The answers for the questions A-1 and B-1 were self-declaration.

Correspondence address: Dr Hideo Orimo, Department of Biochemistry and Molecular Biology, Nippon Medical School, 1-1-5 Sendagi, Bunkyo-ku, Tokyo 113-8602, Japan
Tel: +81-3-3822-2131; Fax: +81-3-5814-8156
Email: orimohd@nms.ac.jp
Accepted 12th December 2005

Table 1. Questionnaire sent to medical schools (in Japanese)

A. IN UNDERGRADUATE EDUCATION OF YOUR MEDICAL SCHOOL	
1. <i>Do you offer a "nutrition" course?</i>	(yes, no)
1.1 If a course is offered, please answer the following questions:	
a. During which academic year students do you offer the course?	() year
b. How many hours do you offer?	() times of () minutes lecture
c. What is the name of department that offers the course?	()
d. Is the course required or elective?	(required, elective, other)
e. Do you offer experiments or practice in the course?	(yes, no)
f. Describe the topics of the curriculum.	
1.2. If a course is not offered, please answer the following questions:	
a. In what course do you provide nutrition education?	()
b. Do you plan to offer a stand-alone nutrition course?	(yes, under consideration, no)
2. <i>Do you offer a "clinical nutrition" course?</i>	(yes, no)
2.1 If a course is offered, please answer the following questions:	
a. During which academic year students do you offer the course?	() year
b. How many hours do you offer?	() times of () minutes lecture
c. What is the name of department that offers the course?	()
d. Is the course required or elective?	(required, elective, other)
e. Do you offer experiments or practice in the course?	(yes, no)
f. Describe the topics of the curriculum.	
2.2 If a course is not offered, please answer the following questions:	
a. In what course do you provide clinical nutrition education?	()
b. Do you plan to offer a stand-alone course?	(yes, under consideration, no)
3. <i>Do you offer practice on nutrition in clinical practice?</i>	(yes, no)
4. <i>Are registered dietitians in the hospital involved in clinical practice?</i>	(yes, no)
B. IN POSTGRADUATE EDUCATION IN YOUR MEDICAL SCHOOL	
1. <i>Do you offer a medical or clinical nutrition course?</i>	(yes, no)
2. <i>If a course is not offered, do you plan to offer a course?</i>	(yes, no)
3. <i>If a course is not offered, how do you provide nutrition education during postgraduate education?</i>	

Because one school offered both a "nutrition" course and a "clinical nutrition" course, a total of 14 schools (24.6% of the responding schools) offered some form of a nutrition course. Among the 45 schools that did not offer stand-alone "nutrition" courses, 25 answered that they offered nutrition-related curriculum in biochemistry or a related course. Ten schools offered it in a clinical course (i.e., in the introduction to clinical medicine, internal medicine, or paediatrics courses), and 5 schools offered it in a social medicine or a public health course. Because nutrition was taught within several overlapping courses in some schools, a total of 36 schools (63.2% of the responding schools) offered at least some topics in nutrition.

Together with the schools that offered a stand-alone "nutrition" course, 48 schools (84.2% of the responding schools) offered some nutrition education. Nine schools (15.8% of the responding schools) did not offer any nutrition course or did not respond to this particular question. One school planned to offer a stand-alone nutrition course, and 3 schools answered that such a course was under consideration. With regard to an academic year, 1 school offered it in the first year, 5 schools offered it in the second year, 2 schools in the third year, 2 schools in the fourth year, 1 school in the third and fourth years, and 1 school in the sixth year. Of the 53 schools that did not offer a stand-alone clinical nutrition course, 28 (52.8%) offered clinical nutrition topics in clinical

courses, including endocrinology and metabolic disease, gastroenterology, paediatrics and surgery; however, 25 schools did not offer any clinical nutrition education or did not specify the course in which clinical nutrition was taught. One school (the same school as will offer a nutrition course) planned to offer a stand-alone clinical nutrition course, and such a course was under consideration in 2 schools. A "clinical nutrition" course was offered in the third year in 1 school and in the fourth year in 2 schools.

The length of the course varied from 1 to 50 h (Table 3). However, the courses that offered 25 to 50h of nutrition education were "biochemistry and nutrition" courses, and the syllabi indicated that the content of the courses dedicated almost basic biochemistry without nutritional topics. In the 7 schools (12.3% of the responding schools) that offered a stand-alone nutrition courses, 5 to 17 h (mean = 9.3 h) were dedicated to proper nutrition content according to their syllabi. Although 1 school answered that they did not offer a stand-alone "nutrition" course, substantial nutrition content (15 h) was offered in the introduction to medicine course. When this school was added to those offering proper nutrition content, only 8 schools (14.0% of the responding schools) offered substantial nutrition education, and mean length of the courses was 10h. Ten schools required a "nutrition" course, while such a course was an elective in 2 schools. All "clinical nutrition" courses were required.

Table 2. Questionnaire for second year students (in Japanese)

1.	<i>Did you attend the four-hour (three-hour) nutrition lectures?</i>			
	a. attended every lectures	b. attended most	c. attended some	d. scarcely attended
2.	<i>Did you understand the contents of the lectures?</i>			
	a. well understood	b. fairly well understood	c. not so well understood	d. scarcely understood
3.	<i>Were the contents of the lectures difficult?</i>			
	a. difficult	b. appropriate	c. easy	d. cannot judge
4.	<i>After attending the nutrition course, are you interested in nutrition?</i>			
	a. yes	b. no	c. cannot judge	
5.	<i>Was the number of the lectures sufficient?</i>			
	a. should be more lectures	b. sufficient	c. should be fewer lectures	d. cannot judge
6.	<i>Many of the other medical schools do not offer a "nutrition" course, and there are no systematic nutrition topics in the "core curriculum". Do you think that a nutrition course is necessary for medical students?</i>			
	a. necessary	b. unnecessary	c. cannot judge	
7.	<i>Many medical schools, including our school, do not offer a "clinical nutrition" course, and there are no systematic clinical nutrition topics in the "core curriculum". Do you think that a clinical nutrition course is necessary for medical students?</i>			
	a. necessary	b. unnecessary	c. cannot judge	
8.	<i>If a clinical nutrition were offered as an elective course, would you select the course?</i>			
	a. would select	b. would not select	c. cannot decide	
9.	Describe freely your opinions or impressions of the nutrition course.			

Table 3. Length of nutrition curriculum content in stand-alone "nutrition" and "clinical nutrition" courses

Length of course (h)	Number of medical schools	Nutrition content (h)
1	2 [†]	1
2	2 [†]	2
5 to 8	4 [‡]	5 to 8
15-17	2 (1 [§])	15 and 17
25	2	4 and 6
35 to 50	2	NA [¶]

The nutrition content in h was based on the syllabi. Although the standard lecture in Japanese medical schools is 90 min, some schools offered 60 to 80 min lectures as 1 h. [†]One school offered "clinical nutrition" course. [‡]One school offered 6-h "nutrition" and 1-h "clinical nutrition" courses. [§]One school offered a 15-h substantial nutrition course in the introduction to medicine course, although the school indicated that they did not offer a stand-alone "nutrition" course. [¶]We could not determine the nutrition content from the syllabi. These courses seemed to be substantial biochemistry courses.

In addition, the department in charge of teaching nutrition was biochemistry and/or molecular biology in 5 schools, the department of internal medicine in 2 schools, the department of paediatrics in 1 school, and the department of nutrition in 1 school. In the other schools, the lectures were given by visiting lecturers or were not specified. Six schools offered experiments or practice in the "nutrition" course.

In clinical practice, 8 schools (14.0% of the responding schools) offered some education in nutrition. In addition, registered dietitians in the hospital were involved in nutrition education in clinical practice in 10 schools (17.5% of the responding schools). There were no medical schools that offered a clinical or medical nutrition course during postgraduate education, although 3 schools

answered that it was under consideration. Few schools offered core clinical or medical nutrition training in their postgraduate education.

We also carried out a survey of second year medical students that had just received a 4-h (in 2004) or a 3-h (in 2005) nutrition course (Table 2). Thirty-nine students in 2004 (39.8% of 98 registered students) and 27 students in 2005 (28.1% of 96 registered students) responded. Although the number of responding students was small, the respondents seemed to be interested in and understand the importance of nutrition education. The results of the questionnaire are summarized in Figure 1. The respondents recognized the importance of either nutrition education (question 6; 84.6% in 2004 and 85.2% in 2005 answered "yes") or clinical nutrition education (question 7; 87.2% in 2004 and 81.5% in 2005 answered "yes").

Discussion

The survey revealed that nutrition education in Japanese medical schools appeared not to be sufficient. Ignorance of clinical nutrition in clinical practice is a cause for concern in the education of future physicians. In our survey, 12 medical schools (21.1% of the responding schools) offered a stand-alone "nutrition" course and a total of 48 schools (84.2% of the responding schools) offered some nutrition topics in their undergraduate education. In contrast, a total of 31 schools (54.4% of the responding schools) offered some clinical nutrition topics. This difference may be due to the fact that some clinical nutrition topics were covered in the "nutrition" courses. Before conducting the survey, we assumed that "nutrition" courses cover the basic sciences concerning nutrition, except for metabolic pathways usually taught in biochemistry courses. On the other hand, "clinical nutrition" courses we assumed covered nutrition topics in clinical medicine. However, the survey indicated that it might have been inappropriate to separate "nutrition" and

“clinical nutrition” in the questions. When “nutrition” and “clinical nutrition” courses were combined, 14 of the medical schools (24.6% of the responding schools) offered a stand-alone nutrition course and a total of 48 schools (84.2% of the responding schools) offered some form of nutrition education. However, we estimated that only 8 schools (14.0% of the responding schools) offer substantial nutrition education. In addition, several schools offered only one to several hours for the stand-alone “nutrition” course (Table 3), suggesting that these courses were not sufficient to allow understanding of nutritional principles for medicine.

The questionnaire survey had some limitations. We sent the questionnaire to the deans of the medical schools, but 22 schools (27.8%) did not respond. In contrast, in the survey carried out by Torti *et al.*,⁴ in the United States, individuals responsible for teaching nutrition were contacted directly. Although their method would achieve more reliable results, a list of teaching staff was not available when we performed the survey. With regard to the student surveys, a poor response rate made them less valid resulting in difficulty interpreting the findings. Because the nutrition course in Nippon Medical School was offered within a biochemistry and molecular biology course and its examination was also given with biochemistry, students had a tendency to be more interested in molecular biology and the percentage of attendance in the nutrition course was low.

Nevertheless, responding students appeared to be interested in nutritional topics and recognized the importance

of the course. In 1997, Watanabe and Saito² surveyed nutrition education in Japanese medical schools. They reported that 9 schools (12.9% of the responding schools) offered a stand-alone nutrition or clinical nutrition course that was 6 to 16 h in length. The current survey of nutrition education in Japanese medical schools indicates slight improvement, but a lack of systematic nutrition education is a problem that still needs to be solved. There are many barriers to the incorporation of nutrition into medical education. Similar to the finding of Winick,⁵ who reviewed medical education in the United States, some of these problems are the limitation of the curriculum in medical schools, a lack of teaching staff, and uncertainty in the topics to teach. To overcome the limitation of the curriculum, nutrition education can be integrated into established basic science and clinical courses, which has been successful in the United States.^{6,7} In our survey, only one school answered that the Department of Nutrition was in charge of nutrition education, suggesting that a faculty for teaching nutrition was lacking at many schools.

In addition to these problems, we do not have a Japanese textbook of nutrition for medical students such as that edited by Hark and Morrison,⁸ although students of dietetics have many available textbooks. A different type of textbook written by Truswell for general practitioners who had been taught almost no nutrition at medical school might also be useful.⁹ Even though a text-book in English would be useful, there is a difference in food culture between Western countries and Japan so that a textbook based on Japanese food traditions may be

Figure 1

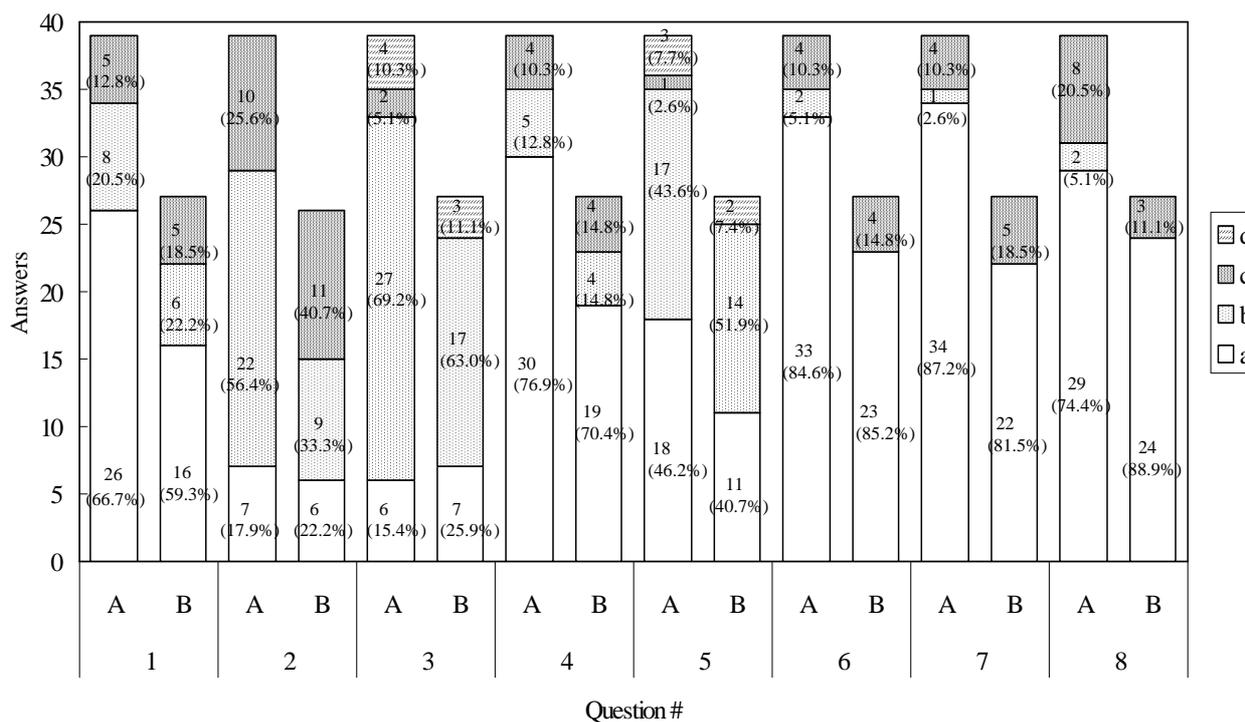


Figure 1. Summary of answers of a questionnaire for second-year students. Question # corresponds to each question number in Table 2. A indicates answers in 2004 and B indicates those in 2005. Small letters (a to d) correspond to the answers in Table 2. Numerals indicate number of answers and numerals in parentheses indicate percentage of the answers.

needed. Finally, recent changes in Dietitian education in Japan, including the national board examination topics and the curriculum for registered dietitians, have shifted the focus to clinical nutrition.¹⁰ These changes should also affect nutrition education in medical schools.

Nutrition education in medical schools in the United States has also been inadequate.^{5,11} The Committee on Nutrition in Medical Education of the National Research Council recommended that a minimum of 25h of nutrition education should be offered to medical students.¹² The American Medical Student Association (AMSA) established the Nutrition Curriculum Projects and the advisory board of AMSA identified 92 topics for instruction.¹³ In 1997, the Nutrition Academic Award Program started to develop nutrition curricula in medical schools and to provide tools for nutrition education.³ Twenty-one medical schools are involved in the project, and the Nutrition Curriculum Guide for Training Physician was published in 2002.¹⁴ The textbook edited by Hark and Morrison (2003)⁸ is now based on this guide. A survey between 1999 and 2000 revealed that 90% of the responding U.S. medical and osteopathic schools offered nutrition education.⁴ The survey also concluded that a number of medical schools incorporate nutrition education into established basic science and clinical courses. An integrated nutrition course was also conducted successfully in a British medical school.¹⁵

Even if it is not sufficient, nutrition education for physicians in the United States is likely to improve. Likewise, we need to make further changes in nutrition education in Japanese medical schools. As suggested by the Nippon Medical School students' survey, medical students that receive a nutrition course recognize the importance of nutrition. In collaboration with registered dietitians in hospitals, we must improve and integrate nutrition education into the training offered by medical schools. This is essential to prevent and care for age-related chronic diseases, which are becoming more common and have been an important public health issue.

Acknowledgement

We are grateful to the deans and officials in all of the medical schools that responded to the survey. We are also grateful to the second year students at Nippon Medical School.

References

1. Committee of Research Cooperators on Medical and Dental Education. On the way of improvement of medical and dental education in the 21st century: For a reconstitution of undergraduate education (In Japanese). Tokyo, 2001.
2. Watanabe A, Saito S. Clinical nutrition education in undergraduate medical education: A questionnaire investigation (In Japanese). *Igaku Kyoiku (Medical Education)* 1999; 30: 99-104.
3. Pearson TA, Stone EJ, Grundy SM, McBride PE, Van Horn L, Tobin BW. Translation of nutritional sciences into medical education: the Nutrition Academic Award Program. *Am J Clin Nutr* 2001; 74: 164-170.
4. Torti, FM, Adams KM, Edwards LJ, Lindell KC, Zeisel SH. Survey of nutrition education in U.S. medical schools—an instructor-based analysis. *Med Educ Online [serial online]* 2001; 6: 8. Accessed 16 November 2004. <http://www.Med-Ed-Online.org>
5. Winick M. Nutrition education in medical schools. *Am J Clin Nutr* 1993; 58: 825-827.
6. Lo C. Integrating nutrition as a theme throughout the medical school curriculum. *Am J Clin Nutr* 2000; 72 (suppl): 882S-889S.
7. Taren DL, Thomson CA, Alexander Koff N, Gordon PR, Marian MJ, Bassford TL, Fulginiti JV, Ritenbaugh CK. Effect of an integrated nutrition curriculum on medical education, student clinical performance, and student perception of medical-nutrition training. *Am J Clin Nutr* 2001; 73: 1107-1112.
8. Hark L, Morrison G. *Medical nutrition and disease: a case-based approach*. 3rd ed. Malden: Blackwell Publishing, 2003.
9. Truswell AS. *ABC of nutrition*. 4th ed. London: BMJ Publishing Group, 2003.
10. Committee on Curriculum for Training Registered Dietitian and Dietitian. Report of the committee on curriculum for training registered dietitian and dietitian (In Japanese). *Rinsho Eiyo (Clinical Nutrition)* 2001; 98: 672-677.
11. Schulman JA. Nutrition education in medical schools: trends and implications for health educators. *Med Educ Online [serial online]* 1999; 4: 4. Accessed 16 November 2004. <http://www.Med-Ed-Online.org>
12. Committee on Nutrition in Medical Education, Food and Nutrition Board, Commission on Life Sciences, National Research Council. *Nutrition education in U.S. medical schools*. Washington, D.C.: National Academy Press, 1985.
13. American Medical Student Association's Nutrition Curriculum Project. *Essentials of nutrition education in medical schools: A national consensus*. *Acad Med* 1996; 71: 969-971.
14. Curriculum Committee of the Nutrition Academic Award Program. *Nutrition curriculum guide for training physician: Practice behavior skills and attitudes across the curriculum*. 2002. Accessed 30 March 2004. <http://www.nhlbi.nih.gov/funding/training/naa/guide.htm>
15. Powell-Tuck J, Summerbell C, Holsgrove G, Garrow JS. Four years' experience of an undergraduate medical nutrition course. *J R Soc Med* 1997; 90: 67-72

Original Article

Nutrition education in medical schools in Japan: results from a questionnaire survey

Hideo Orimo MD, PhD¹, Toshiro Shimura MD, PhD² and Takashi Shimada MD, PhD¹

¹*Department of Biochemistry and Molecular Biology, Nippon Medical School*

²*Center for Educational Development, Nippon Medical School*

日本医学院的营养学教学：一次问卷调查得出的结果

饮食在大多数跟年龄相关的慢性疾病的发病机理中扮演重要角色，这在日本和其它工业化国家中越来越普遍。但是，传统的医学教学并没有提供足够的营养学方面的知识。为了了解日本的营养学教学的现状，我们向日本各地的医学院发放了一份调查问卷，来调查他们的营养学课程。这份调查问卷发放到日本的 79 个医学院，包括除了作者所在学校以外的所有医学院。我们还向医学院的二年级学生发放了一份调查问卷，他们刚刚在 Nippon 医学院上了一门短期的营养学课程。57 所医学院的学生 (72.2%) 回应了调查问卷：12 所 (回应学校的 21.1%) 开设了“营养学”课程，3 所 (5.4%) 开设了“临床营养学”课程。回应学校中的 14 所 (24.6%) 在他们的研究生教育中开设了独立的营养学课程，包括“营养学”和“临床营养学”课程。虽然回应学校中的 48 所 (84.2%) 曾提出营养学的话题，但只有 8 所 (14.0%) 可能曾提供实质性的营养学教学。这些学校都没有开设关于医学的或临床营养学方面的研究生课程。虽然如此，80% 以上的看起来对营养学课程有兴趣的学生认识到在医学院里营养学教学的重要性。这项调查显示，日本医学院的营养学教学仍然不足，这种状况必须有所改变。

教育、医学院、日本、问卷、课程。