



The Columbia University
**JOURNAL of
GLOBAL HEALTH**

A Glimpse into the Care of Diabetic Patients in Tokyo, Japan through Educational Hospitalization Program

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ABSTRACT Type 2 Diabetes Mellitus is a rapidly growing disease within the Japanese population. Thus, there is growing demand for high quality health care with long-term health benefits for diabetic patients. The goal of this manuscript is to discuss how Educational Hospitalization Program, a service not practiced in the USA, is used to meet this growing demand for diabetic patients in Japan. The benefits of Educational Hospitalization Program include close monitoring of patients by care givers to optimize pharmacological interventions, facilitation of communication among patients and care providers, and providing structured educational environment for the patients. All of these benefits help patients incorporate healthy routines in their lifestyle to manage their health conditions. Incorporation of a similar programs in USA may provide health benefits for the patients and reduce total healthcare cost.

The rise in the prevalence of diabetes is a global trend. According to the World Health Organization, the population with diabetes rose from 4.7% since 1980 to 8.5%.¹ Japan, where I spent my childhood, is no exception; approximately 12.1% of the population are living with diabetes.² As diabetes is emerging as a global health issue, I became curious about how care is being provided for patients with diabetes in Japan. Thus, I shadowed Dr. Yukiko Onishi, a diabetologist at The Institute of Adult Diseases at Asahi Life Foundation (Asahi Clinic) during summer of 2017 to gain this insight. In this paper, I will discuss the role of Educational Hospitalization Program for diabetic patients in Japan, a service currently not practiced in the USA.

Type 2 Diabetes Mellitus (T2DM) is a common chronic disorder characterized by hyperglycemic state. The primary defect may be development of resistance to insulin or progressive pancreatic β -cell failure to secrete insulin.³ Hyperglycemic states may result in serious consequences such as diabetic neuropathy, retinopathy, nephropathy, myocardial ischemia, gangrene, or stroke. This disorder is growing rapidly within the Japanese population. According to the national survey in 2016 held by Ministry of Health, Labor, and Welfare, 12.1% of the Japanese population are estimated to have T2DM.² Japanese and others Asian ethnic groups are more prone to developing T2DM compared to other ethnicities for several reasons. First, Asians are genetically more prone to abdominal adiposity, which is abdominal fat that occurs specifically around the abdominal area. Those with abdominal adiposity, compared to overall adiposity, are more likely to develop insulin resistance, inhibiting the glucose from entering insulin-sensitive tissues such as fat, skeletal, and cardiac muscles. Glucose remains in the circulation which results in elevated blood glucose level.⁴ Even with low Body Mass Indexes (BMI), Asians are more prone to T2DM than to Caucasians due to their tendency to have higher abdominal adiposity.^{5,6}

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The mechanism for this difference is still unclear, but it may be due to lower capacity to store fat in peripheral regions for Asians.⁷ To account for this physiological difference, the BMI cutoff point to indicate elevated diabetes risk was lowered from ≥ 25 kg/m² to ≥ 23 kg/m² specifically for Asian Americans by the American Diabetes Association (ADA).^{5,6}

Second, the westernized diet may make Japanese people more prone to developing T2DM.⁸ While traditional Japanese food is characterized by low fat and calorie content, a shift in people's preference for processed food with higher animal fat and calories is thought to have increased abdominal adiposity. Once again, increased abdominal adiposity leads to insulin resistance that cause elevation in blood glucose level, eventually resulting in T2DM.⁹ As the control of blood glucose levels is key in treating diabetes, a patient's lifestyle and habits significantly impact the treatment outcome. Thus, inpatient setting with the opportunity for close monitoring by a team is ideal for patient education about the disease, as well as lifestyle and habit modification. Educational Hospitalization Program was developed to achieve these goals.

Educational Hospitalization Program was originally designed to standardize the care for patients who have been hospitalized for diabetic related reasons. Before the development of the program, it was mainly the assigned nurse who provided education for the patients but other healthcare providers such as pharmacists and nutritionists were involved in patient education as well. The content of education was not standardized, and there was often misunderstanding among the nurses and other healthcare providers about what information was already communicated to each patient.¹⁹ Thus the Educational Hospitalization Program was developed to address these issues. Although the program duration and content are variable among the facilities, the program lasts approximately 2 weeks. It is mainly targeted for diabetic patients in non-critical conditions who struggle to control their diabetes or show an acute deterioration in their diabetic conditions. Newly diagnosed patients are also recommended by diabetologists for hospitalization. The care team is formed of diabetologists, nurses, pharmacists, lab technicians and nutritionists. The underlying goal of the program is to decrease long-term healthcare spending by proactively educating patients and optimizing pharmacological interventions, such as the amount and timing of insulin shots. Proper maintenance of blood glucose level is crucial in avoiding DM-related complications, which require costly surgical interventions. This program is financially feasible for patients because it is partially covered by the national insurance system. The coverage is 70-90% depending on age and income. Although the fee varies by facility, the cost is approximately \$90 per night, which include three meals prepared by dieticians.

Educational Hospitalization Program are held in established medical centers as well as in independent facilities. One issue that some independent medical clinics face is the lack of profit due to the limited amount of resources in the clinic, such as the number of beds and space. Additional revenue sources to maintain the program is necessary. At some clinics including Asahi Clinic, this revenue come from conducting clinical trials of upcoming diabetic drugs. The clinic receives fixed amount of reimbursement for each patient that has been carefully selected to enroll in clinical trials. Communication between clinicians and pharmaceutical companies are mediated by Pharmaceutical Representatives (PRs), who play a role in promotional activities for the pharmaceutical companies. Such activities include providing information about their new drugs, providing samples and inexpensive gifts such as pens and notepads, and sponsoring events such as medical seminars. Involvement in promotional activities is a common practice in Japan. However, the exchanges between physicians and PRs is not always beneficial for physicians. Internists in Japan meet PRs five to ten times a month.¹⁰ Pertinent clinical data will not be available with such frequency, and many physicians I interacted with in Japan complained that exchanges with PRs took time away from their schedule.

Interaction with the PRs may even impact physician's clinical practice as well. According to a recent survey-based study, although many clinicians valued PRs as source of information, many also believed their colleagues were likely to be influenced by the promotional activities.¹⁰ Such influence may include greater reliance on information from PRs and less on published research findings when choosing drugs to prescribe for patients. According to Dr. Onishi and other sources, the number of T2DM medication options have expanded rapidly within the last 10 years.^{11, 12} Unlike the USA where there is a set guideline for medication (Metformin as the first line, and Sitagliptin as the second line drug¹¹), no pre-determined guideline exists in Japan. Although this may provide opportunities for more individualized care, it also encourages PRs to endorse drug products from their company.

The core goal of diabetic Educational Hospitalization Program is two-fold: patient education through seminar sessions and nutritional therapy. At Asahi Clinic, seminar sessions are held twice daily. Diabetologists engage with patients in morning seminars on various topics such as the etiology of the disease, clinical symptoms, and

both pharmaceutical and lifestyle treatments. The morning sessions are essential for patients to understand their illness, but also to encourage interaction between patients and physicians as outpatient clinical hours are often limited in time, lasting only about 10 to 15 minutes. Dr. Onishi once told me that the role of diabetologist is similar to that of a coach. Diabetologists do not perform interventional procedures but instead guide patients through their treatment journey. Educational Hospitalization Program provides an environment for patients and physicians to develop mutual understanding of each other, encouraging patients to continue to seek care post-discharge.

The afternoon seminars provide further educational and question/answer opportunities. Held by a nurse, pharmacist, lab technicians or nutritionist, the topics pertain to day-to-day lifestyle choices and include recommended diet, tips to decrease calorie and salt intake, recommended exercise, and administration of insulin shots. In one early study of Educational Hospitalization Program consisting of a three-day hospitalization followed up by telephone counseling showed significant improvements in lifestyle changes and knowledge about the disease, reduced BMI, and improved blood glucose level post-discharge in patients who were enrolled in the program.¹³ The study attributes this success to improvements in physical and dietary lifestyle. While lifestyle adjustment is one important benefit of the program, interaction among the patients also plays a key role. For example, a patient shared the brand of soy sauce used to reduce salt content in her cooking. The exchange of information among the patients was encouraging to observe because it showed their willingness to help each other. Many patients complained that a life with diabetes is filled with dietary restrictions and exercise requirement. While instructions from physicians who may not understand the struggles of such restrictions may be difficult to accept by patients, advice from a peer diabetic patient walking on the same journey may be easier to incorporate into one's life. In fact, the most powerful role of Education Hospitalization Program is to create an environment that allows patients to share their difficulties. Through open discussion, patients gain the opportunity to reflect on struggles that they face daily. Such struggles may include anxiety to administer insulin shots in public before meals or difficulty in finding time to exercise. Many patients are willing to provide advice on how they overcame their struggles, such as administering insulin shots in a bathroom stall or walking extra distance during daily commute. These seminars provide safe environment for patients to share their struggles with care team as well as other diabetic patients in an effort to come up with potential solutions together. Such development of human relationships is crucial in managing a patient's health conditions. Based on an interview-based study conducted by nurses working in Japan, the benefits of the program include accepting the reality of having diabetes, sharing struggles with care teams and other patients to maintain emotional balance, and understanding the necessity to share their pain with family members.¹⁴ As patients learn to share their struggles during the hospitalization period, many gain courage and comfort in asking support from their family members. Support from family members includes preparing balanced meals, administration of insulin shots, or helping with commuting for routine appointments with the care team. Thus, Educational Hospitalization Program not only provides therapeutic effects, but also encourages patients to form an understanding care environment upon discharge.

Nutritional therapy is another key component of Educational Hospitalization Program. Each day, dieticians prepare three meals that patients enjoy together as they study calorie content and ingredients written on the board. Nutritional therapy is the most important method to control blood glucose level compared to physical and pharmacological treatments because carbohydrate absorbed from diet has direct impact on the blood glucose level.¹⁵ Nutrition therapy in Educational Hospitalization Program helps patients realize that although preparing a balanced diet may be difficult and time consuming, it is possible and appealing to taste. Hearing various patients discuss about coping with diabetes, I found that social norms in Japan make it difficult to make healthy life choices. For example, people employed at Japanese companies dine at restaurants very often for various reasons including welcoming guests or team-building. The daily drinking rate is 44.7% for 50-59 years old Japanese men.¹⁶ Alcoholism often leads to malnutrition that results in uncontrolled blood glucose level.¹⁷ As I watched hospitalized patients gaining understanding about their health conditions and making decisions to attend these events less often through discussion among the patients, I once again realized how powerful interaction among patients can be. The essence of Educational Hospitalization Program lies in helping patients realize that managing their health becomes effective with the help of other. While the support groups formed during hospitalization does not last after the program, the patients are given the opportunity to reflect on their life and make a conscious effort to create supportive environment with their family members and medical care team post-discharge.¹⁴

In summary, the Educational Hospitalization Program in Japan is an effective method of treatment for patients with DM. The program allows for close monitoring by care givers to adjust pharmacological interventions,

facilitates more personal guidance for patients, and provides organized environments for patients to learn about their illnesses. Through seminars and introduction to nutrition therapy, patients learn to incorporate healthy physical and dietary life habits in their lives. Lastly, the program allows patients to reflect on the importance of developing supportive environment to manage their health. Future studies include exploring the possibility of introducing a similar program in USA. There have been studies in the USA indicating that inpatient diabetes management substantially improves both healthcare cost burden and health outcomes for patients.¹⁸ However, patient education was restricted to one session lasting 60 to 90 minutes with a physician or nurse practitioner focusing on areas such as insulin administration and management of hypoglycemia. This is in contrast to the Educational Hospitalization Program that is usually held over two weeks in a group setting covering broader topics in depth. Other differences include the fact that patients enrolled in this study were hospitalized for reasons other than uncontrolled diabetes and the length of hospitalization varied depending on the patient condition, many of whom were in critical conditions. Incorporating structured educational programs and nutrition therapy for newly diagnosed and stable diabetic patients will be beneficial for managing diabetic patients in the USA. The obstacles may include the financial sustainability of the program and financial burden on patients in the absence of insurance coverage, which may be complicated because USA did not adopt universal healthcare system like in Japan. Furthermore, providing nutritional therapy to multi-ethnic patient population with diverse food preferences may be difficult. However, if Educational Hospitalization Program can be proven to stabilize health conditions for diabetic patients, preventing morbid diabetic complications that require costly hospitalizations and surgical interventions, then it may encourage insurance companies to provide coverage for the program. Providing ethnically-oriented nutrition guideline will allow patients to incorporate nutrition therapy with ease.

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