

A Longitudinal Observation of Chronic Disorders among Female Japanese Students through Primary-Care Practice

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Abstract

Primary care was the basic policy of student health services adopted by a medium-sized women's university in Tokyo during the 1980s. A small team at the Centre for Health Care(CHC) served a total of 4,486 female students aged mainly 18 to 22 years throughout the 10-year period.

Emphasis was placed on daily clinical and counseling services for students as well as employees, while maintaining an effort to dispel any impression of being regulated. Through efficient utilization of the CHC's

services by target populations, the campus community as a whole was well-motivated so that a large amount of health information became available.

Based upon information thus collected and subsequently analyzed, a health grading was worked out for each student. An average of 7% of the students in each cohort by enrollment years were found to possess some chronic disorders. Anemia and amenorrhoea were the two most consistently observed disorders. In 6 fiscal years out of the 10-year period under study, mental disorders occupied the first rank. The 10-year average of the prevalence rate (per 1,000) was 21.2, 17.8 and 13.2 for hematopoietic disorders, mental disorders and amenorrhoea, respectively.

Of 314 students with chronic disorders, 61.8% were discovered during their voluntary visits to the CHC clinic, whereas mass-screening picked up merely 9.9%. Under the given conditions, it is concluded that primary care in the campus community is not only conducive to motivating individual students toward health awareness, but also beneficial for the management of chronic disorders among them.

Introduction

Student health services in Japanese universities had been practically non-existent until the mid-60s when they were first introduced through the stipulation of the Ministry of Education for 70 or so national universities. An independent institution for student health services was first established at 3 national universities in 1966, which was followed by gradual expansion to the rest of the national universities. As of 1990, 90 national universities had student health services in operation. The 1966 directive for student health services stipulated that: a) maintenance as well as the promotion of student health should be the aims of student health services; b) a proper institution directly under the president's office should be in charge; c) such an institution shall be staffed by a full-time professor, preferably in a medical/health discipline, and a number of assisting paramedicals depending upon the capacity of each university.

Strategy toward promoting student health has been left largely to each university, namely, to the professor

in charge. Although annual mass-screening was unanimously accepted as the minimum requirement, various additional approaches were adopted. For example, some universities placed the major emphasis on mental health, while other universities operated a modest outpatient clinic for students and employees.

Ochanomizu University is one of only two national women's universities in Japan. The university is composed of three faculties, postgraduate courses, the doctorate course, an attached kindergarten, primary & secondary schools and a few specialized institutes. Annual undergraduate enrollment averaged 450 during the 80s.

In 1976, the author was assigned to the Centre for Health Care (CHC) as Professor in charge of student health. A registered nurse was the only other permanent staff member. The CHC was divided into two divisions: the clinic, which included medical services & gynecology, and the counseling section. Three consultant doctors, namely a hematologist, a psychiatrist and a female gynecologist served at regular intervals. The psychiatrist was assisted by a registered clinical psychologist 5 days per week in student counseling.

Though the primary target of health care was students, as stipulated by the Ministry, most national universities wrote bylaws to include employee health as part of the university health centre mission. Ochanomizu University was no exception.

The personnel heretofore mentioned and the day-to-day activities of the CHC which will be stated later in the text remained unchanged until March 1993 when the author retired. This is considered to have given us an excellent opportunity to review the epidemiological trend of common disorders in a community of female university students during the 1980s in Japan.

Materials and Methods

1. Day-to-Day Activities of the CHC

The activities of the CHC were classified into three categories, namely periodical mass-screening, outpatient/client services, and health education. Table 1 shows 5 major screening categories, the

Table 1 Periodical Mass-Screening Implemented under the Supervision of the CHC

Contents	Subjects	Frequency	Coverage
Basic screening	undergraduates (1,600~2,000)	annual	86% of the 1st & 4 th - year students
	post-graduate & doctorate students (400)		
	employees: full times (400)	annual	90% of administrative & clerical staff
	part-times & temporary (150)		average 60%
Hematology*	radioisotope handlers: teaching/research staff, students & research fellows	bi-annual	100%
Upper GI series*	full-time employees over 35 years of age	annual	25~30%
Blood biochemistry	full-time employees over 35 years of age	annual	25~30%
Dry-dock check-up**	full-time employees over 40 years of age	annual	35~40%

* Partially carried out by commercial laboratories.

** Carried out by a number of private institutions under contract. The CHC reads results and follows up when necessary.

Table 2 List of Clinical Tests Routinely Available at the CHC

Tests	Items	Device/Method
Physical	chest X-ray electrocardiogram ultrasonogram	-
Urinalysis	pH, protein, occult blood, glucose, acetone, urobilinogen, bilirubin	Ames [®]
	sediment microscopy	-
ESR	-	-
Hematology	RBC, Hb, Hct, WBC, platelet	HA-5 [®] subsequently QBC system [®]
	differential count of WBC, reticulocyte count	manual
Biochemistry	TP, albumin, GOT, GPT, LDH, ALP, GGTP, ZTT, amylase, total cholesterol, triglyceride, creatinine, urea nitrogen, uric acid, Fe	RaBA system [®] subsequently Vision system [®]
	glucose	Vision system [®] or Reformat [®]
Serology	CRP, RA, pregnancy test, fecal occult blood	latex

implementation of which were based on relevant laws. By far the most laborious checks were basic screening for students and blood chemistry tests for employees.

One unique feature of the CHC was outpatient services for students and employees. The clinic was open 6 1/2 days per week throughout the year except holidays, from 09:00 to 16:30 with a one hour lunch break.

All medical care including medicines, surgical treatment and laboratory tests were provided free of charge.

Table 2 lists clinical and laboratory tests conducted routinely in the CHC. Whenever a patient's status was found to be beyond the technical and/or budgetary capacity of the CHC, referral was made to nearby hospitals.

Needless to say, an educational component was a pre-requisite to routine medical services for student patients. Regarding health education in classrooms, a 90-minute lecture was given to all first-year students on topics such as health versus diseases and homeostasis. A semester course on clinical pathology was an elective subject. In addition to the above, there were ad hoc lectures from time to time on current topics including medicine & health, endogenous psychoses, doctor-patient relationships, the environment and AIDS.

2. Target Population

Japanese students in the three undergraduate faculties enrolled during the decade of the 80's were the exclusive target of the present observation. They were enrolled in April, mostly at the age of 18 for a four-year course of study. The number of new students each year varied from 407 to 584. Approximately 95% of each enrollment cohort completed their studies in 4 years, while the rest needed a 5th year to

graduate. It should be noted that the present cohort study spans the main 4 years but includes a negligible number of students who were actually observed for 5 years. The longitudinal size of the target population is, therefore, 4,486 in total.

3. Methods of Observation

The major objective of the epidemiological observation was to follow up incidences of disorders which: a) were relatively common among female Japanese students, and at the same time, b) required long-term care. Accordingly, either short-term episodes or self-limiting diseases were disregarded.

Case-findings were made almost exclusively through routine services. Effort was made to collect as much information as possible relevant to the health of each student using a single machine-sortable data sheet. For the sake of convenience, this sheet was called a student health card. It was distributed to freshman students during orientation to be filled out and solicited such information as ID number, previous illnesses, and history of untoward reactions to food, drugs and/or biomedical products, if any. To be noted are checked items for i) previous proteinuria/hematuria during high school, ii) eating habits (regular/irregular), iii) hypermenorrhoea (with clots or not), and iv) amenorrhoea. The remaining space of the front side of the sheet was for a summary of clinical episodes during the 4 undergraduate years. The back side of the sheet was used to describe results of annual mass-screening.

There were various activities conducted by the CHC. Perhaps the most time-consuming part of the present observation was inputting each student's information onto the health card. This work was usually done in August two months subsequent to an annual mass-screening, when very few students visited the CHC because of summer vacation. By far the largest amount of information was obtained from clinical charts, since as many as 85% of each cohort visited either the clinic or the counseling section. During the period of observation, an arrangement was made between the Red Cross Association and the CHC by which the former provided the latter with hematological data obtained in blood donation campaigns which were held twice a year on campus. Although the counseling section was operated semi-autonomously under the supervision of the consultant psychiatrist, daily submission of the client list to, and provision of psychiatric medicine through, the clinic benefited the CHC in terms of information collection. The gynecologist shared the same

Table 3 Combined Criteria for Classification by Health Grading

Daily school life	A	suspended from attendance
	B	conditional attendance allowed by restricting: days or hours of attendance, and/or physical/mental burden
	C	attendance not restricted except for heavy exercise
	D	no restriction
Clinical aspect	1	need treatment
	2	to be followed up periodically
	3	no intervention

clinical charts with the author and prescribed medicines through the same channel as above.

Following the completion of input work, students were classified in accordance with the criteria shown in Table 3. The resulting health grading of each student was reviewed annually for revision if necessary. Students with the aforementioned disorders are those not included in the D-3 category of no intervention and no restriction.

Results

1. Mass-Screening

It was customary to implement a mass-screening for students during a 3-day period in the first week of June each year. In principle, the screening was compulsory for all the registered students, but for practical reasons, only first and fourth year students were strongly encouraged to take it, otherwise it was left to their discretion.

As regards the contents of the physical screening, body measurement, eyesight, auscultation, visual checks for skin, oral mucosa and conjunctiva, palpatory checks for cervical lymphnodes and struma were accompanied by a chest X-ray. Urinalysis was carried out separately with priority attached to those with previous urine anomalies. Students identified with potential problems from the above screening were followed up subsequently for additional diagnostic tests.

Since as many as 300 students were screened within 4 hours in one afternoon, 4 physicians, two X-ray technicians employed from outside, and several administrative assistants of the university reinforced the CHC staff.

Table 4 shows percentages of students who participated the mass-screening held in the initial and final years of the observation period. Between these years, the number of registered students increased by 30.3%. Nevertheless, the participation rate of total students increased by 3%. It is noted that the bipolar concentration of participants to the first and 4th year students appears more marked in fiscal 1990.

Table 4 Rates of Recipients in Mass-Screenings in 1981 and 1990 Undergraduates Only

Undergraduate years	No. of recipients / No. of students registered (%)	
	in the fiscal year of	
	1981	1990
1	340 / 417 (81.5)	496 / 543 (91.3)
2	69 / 406 (17.0)	56 / 504 (11.1)
3	82 / 417 (19.7)	18 / 518 (3.5)
4	276 / 434 (63.6)	458 / 530 (86.4)
Total	767 / 1,674 (45.8)	1,028 / 2,095 (49.1)

Table 5 Care Provided by the CHC Clinic for Students****

Care by item		Number* of students cared for by CHC per fiscal year									
		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Physical examination	general	1,565	1,659	1,757	2,078	1,639	1,799	1,360	1,555	1,413	1,663
	surgical	638	543	654	694	469	521	442	460	462	478
	dermatological	289	461	434	537	336	462	393	380	411	478
	ophthalmological	149	177	177	234	162	181	165	199	121	176
	otorhinopharyngological	44	48	70	34	47	65	45	37	42	46
	others	23	22	31	8	4	7	6	8	12	17
Subtotal		2,708	2,910	3,123	3,585	2,657	3,035	2,411	2,639	2,461	2,858
Consultation	gynecological	103	127	112	150	112	121	112	141	161	155
	others**	128	187	232	424	425	587	552	560	531	488
	Subtotal	231	314	344	574	537	708	664	701	692	643
Diagnostic test	urinalysis	120	168	225	231	205	238	166	143	156	121
	hematology	93	97	100	125	87	128	99	68	90	125
	ESR & serology	81	59	50	59	72	37	42	32	41	47
	chemistry	24	20	11	18	23	16	8	10	14	30
	X-ray	61	46	31	34	1	1	5	12	0	10
	ECG	19	33	22	37	33	30	21	25	27	22
	others***	22	33	43	49	19	30	24	14	9	17
Subtotal		420	456	482	553	440	480	365	304	337	372
Response	medication	2,060	2,667	2,878	3,199	2,697	2,921	2,539	2,641	2,540	2,693
	treatment	687	713	702	1,024	703	866	770	675	611	609
	infirmary bed	74	119	110	115	79	117	104	111	79	85
	referral to specialists	31	52	44	78	82	138	105	143	129	108
	injection	22	26	33	24	22	26	17	46	20	18
	housecall	4	6	5	7	7	8	8	8	5	6
Subtotal		2,878	3,583	3,772	4,447	3,590	4,076	3,543	3,624	3,384	3,519
TOTAL		6,237	7,263	7,721	9,081	7,224	8,299	6,983	7,268	6,874	7,392

* Does not necessarily indicate a number of visits as single visit may result in tests & medication.

** Excludes services provided by the counseling section.

*** Includes ultrasonography, bacterial & viral tests.

**** Undergraduates & postgraduates combined: 1988 population of which were 1920 & 377, respectively.

Table 6 Pattern of Diseases Commonly Contracted by Students Based upon Clinical Charts

Disease area	Cohort 1978~		Cohort 1985~	
	Number of episodes	percent composition	Number of episodes	percent composition
Respiratory	258	32.3	605	34.6
Dermatological	139	17.4	299	17.1
Motor system	82	10.3	203	11.6
Ophthalmological	82	10.3	158	9.0
Digestive tract	62	7.8	143	8.2
Female genitalia & breast	35	4.4	122	7.0
Nervous system	22	2.8	55	3.1
Reno-urinary tract	11	1.4	33	1.9
Immunological	20	2.5	28	1.6
Otorhinopharyngological	17	2.1	27	1.5
Mental	17	2.1	16	0.9
Systemic infection	9	1.1	13	0.7
Cardiovascular	12	1.5	12	0.7
Hematopoietic	8	1.0	8	0.5
Metabolic & hormonal	9	1.1	4	0.2
Hepato-biliaro-pancreatic	1	0.1	1	0.1
Others	16	2.0	20	1.1
TOTAL	800	100.2	1,747	99.8

2. Activities of the Outpatient Clinic

The types of care given to students each fiscal year are shown in Table 5 broken down according to category of care, namely physical examination, consultation, diagnostic tests and actions (predominantly therapeutic) taken by the CHC in response to a student's visit. Assuming that the annual totals indicate a gross amount of professional labour consumed by students, this amount varied between 6 to 9 thousand with an average of 7,434 per year regardless of enrollment. On the other hand, both health consultation in general (others) and referral to outside specialists increased steadily.

Dermatological examinations and gynecological consultations seem to have increased partly due to larger enrollment in the late 80's. X-ray tests both for chest and bones were gradually abandoned because of poor cost performance. Other items show little change.

It should be noted that the average student made three visits to the CHC per year, which indicates a high rate of voluntary utilization of the clinic by students.

3. Diseases Commonly Contracted by Students

The cohort of students enrolled from 1985 to 1989 (cohort 1985~) was followed up for a 4-year period in order to study the relative incidence of diseases common among students and managed by the CHC clinic.

Students who graduated in 1982 (cohort 1978~) are plotted for comparison in Table 6.

It is noted that the breakdown of episodes by disease area shows little change between two cohorts despite more than a two-fold increase in the total number of episodes. By far the most common disease was upper respiratory infections, namely, colds. Skin conditions, which are in the second rank, consisted of injury, infection, dermatitis, and urticaria. The majority of motor system disorders were muscle/tendon injuries such as sprains. Peptic ulcers were rare, while dyskinetic disorders such as irritable bowel syndrome occupied most of the digestive tract diseases. Regarding nervous system disorders, commonly seen were vegetative instability, headaches of undetermined etiology and insomnia. As well, there were also two cases of benign pituitary adenoma. The greatest proportion of reno-urinary tract disorders were acute cystitis.

Most gynecological and mental disorders were taken care of by the consultant gynecologist and psychiatrist respectively. Amenorrhoea with eating disorders was an increasingly common condition during this decade, hence will be mentioned separately.

As the size of the 1985 cohort was 412, the average incidence of disease episodes falls by about one per year. It seems noteworthy that 361 out of the 412 students (87.6%) visited the CHC clinic at least once during the 4-year period according to statistics.

4. Disorders which Required Long-Term Care

General Incidence Most clinical episodes encountered at the clinic were naturally self-limiting. Only a small percent of students needed long-term (over one year) care as a consequence. These students were subjected to more elaborate tests at the CHC or referred to specialists elsewhere in order for the author to establish diagnosis. The annual number of students who were taken care of for a long term is summarized in Table 7.

The percentage of students taken care of varied between 5.4%(1988) and 9.5%(1982), with an average of 7.0%. Apparently, there were no particular trends.

Table 7 Occurrence of Chronic Disorders among Students by Enrollment Cohort and Area of Disorder

Area of disorder	Number of students with chronic disorders by enrollment cohort										area sub- total	preva- lence rate* /1000
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990		
Hematopoietic	15	6	12	19	4	7	5	6	9	12	95	21.2
Mental	4	14	2	3	10	13	7	8	15	4	80	17.8
Gynecological	4	13	8	2	7	5	5	1	10	4	59	13.2
Cardiovascular	0	6	0	2	3	2	4	7	3	7	34	7.6
Reno-urinary tract	1	2	3	2	1	4	1	1	4	4	23	5.1
Metabolic & hormonal	2	0	4	2	0	3	3	2	0	4	20	4.5
Hepato-biliaro-pancreatic	1	2	2	0	1	0	3	0	1	0	10	2.2
Respiratory	1	0	1	0	0	0	2	0	0	3	7	1.6
Digestive tract	0	1	0	2	0	0	0	0	0	0	3	0.7
Others	2	2	4	3	1	1	3	1	1	3	21	4.7
Subtotal by cohort	26	39	31	32	23	33	30	26	35	39	TOTAL** 314	
Cohort size at enrollment	407	412	412	412	412	412	475	480	480	584	4,486	
% of students with chronic disorders	6.4	9.5	7.5	7.8	5.6	8.0	6.3	5.4	7.3	6.7	7.0	

* Calculated against 4,486, the 10-year total.

** Indicates number of students, not incidence of disorders.

Table 8 Students Requiring Long-Term Follow-up for Hematopoietic Disorders

Diagnosis	Number of students by enrollment cohort										Total
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	
Iron-deficiency anemia	13	6	11	18	4	6	4	6	6	10	84
Anemia of other types	1	0	1	1	0	0	0	0	1	1	5
Leukopenia	1	0	0	0	0	1	0	0	1	0	3
Thrombocytopenia	0	0	0	0	0	0	1	0	1	0	2
Refractory anemia	0	0	0	0	0	0	0	0	0	1	1
Total	15	6	12	19	4	7	5	6	9	12	95

Incidence by Area of Disorders (Table 7) If we look at the 10-year average in decreasing order, the highest incidence of disorders is seen in the blood system, followed by mental disorders (2nd), and gynecological conditions (3rd). Cardiovascular disorders ranked 4th on average, but occupied second place in 1988 and 1990 and third place in 1982. The three areas cited here demonstrated a high incidence persistently throughout the 10-year period.

Although placed 5th on average (5.1%), disorders in the reno-urinary tract system, practically all of which were chronic nephropathy, reveal a less patchy occurrence than cardiovascular disorders. The rest of the disorders occurred more or less sporadically, such as cases of active tuberculosis.

Disorders in the Hematopoietic System (Table 8) Out of a total of 95 cases, 90 were anemia, 93.3% of which were cases of iron deficiency. No etiological cause was specified for the remaining cases of anemia, which were predominantly normochromic. All cases of iron-deficiency anemia (IDA) which appear in Table 8, were treated with iron. Of importance to note was a case of refractory anemia discovered in 1990. A large number of IDA cases improved within one year either through iron therapy or nutritional precautions, and hence are not included in Table 8.

Mental Disorders (Table 9) Since not all 80 cases which appear in Table 9 were diagnosed by the consultant psychiatrist after his examination, the breakdown is partly based upon tentative diagnosis at the primary-care level, primarily for an epidemiological review.

Incidences of schizophrenia and depression seem to be relatively consistent, yielding 1.3 and 1.0 cases per cohort respectively. On the contrary, incidents of anorexia nervosa (A.N.) appear to have fluctuated markedly. Incidentally, there were 13 cases of A.N. and two cases of bulimic-anorexia among a total of 27 cases of eating disorders. One case of A.N. in the cohort of 1982 committed suicide in 1983.

Table 9 Students Requiring Long-Term Follow-up for Mental Disorders

Diagnosis	Number of students by enrollment cohort										Total
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	
Schizophrenia	1	3	1	0	2	0	2	1	2	0	12
Depression	1	1	0	0	3	1	0	1	2	1	10
Depressive episode	0	1	0	1	0	2	1	0	0	0	5
Psychogenic reaction	1	1	0	1	1	3	0	0	1	0	8
Neurosis	0	2	0	1	0	2	2	1	1	0	9
Anorexia nervosa	1	5	1	0	2	1	0	0	4	1	15
Eating disorders other than anorexia nervosa	0	0	0	0	2	2	2	3	2	1	12
Student apathy	0	0	0	0	0	1	0	0	3	1	5
Behavioural disorders	0	1	0	0	0	1	0	2	0	0	4
Total	4	14	2	3	10	13	7	8	15	4	80

Amenorrhoea (Table 10) The annual average of gynecological consultations calculated from Table 5 is 129.4. These consultations were provided mainly by the consultant gynecologist. The most frequently occurring subjects of the consultations were amenorrhoea, habituel dysmenorrhoea, irregular periods, pregnancy control, unwanted pregnancy, sexual practices, vaginal infections and lumps on the breast. However, it was only amenorrhoea which required long-term care.

Table 10 shows a breakdown of 59 cases of amenorrhoea by cohorts and types. Of importance to note is a concentration of amenorrhoea cases subsequent to weight loss not as severe as those in A.N. in the early 80s. It seems outstanding that the '82 cohort yielded a total of 10 weight-losing amenorrhoea cases should the 5 A.N. cases be included. Many but not all of the cases of amenorrhoea without weight loss revealed a history of major psychological trauma prior to the onset. Eating disorders other than A.N., such as

Table 10 Students Requiring Long-Term Follow-up for Amenorrhoea

Amenorrhoea by type	Number of students by enrollment cohort										Total
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	
Primary	0	0	0	0	0	0	1	0	1	0	2
Accompanied with anorexia nervosa	1	5	1	0	2	1	0	0	4	1	15
Accompanied with other eating disorders	0	0	0	0	1	0	1	0	1	0	3
Subsequent to weight loss excluding anorexia nervosa	2	5	3	1	3	1	0	0	1	0	16
Others without weight loss	1	3	4	1	1	3	3	1	3	3	23
Total	4	13	8	2	7	5	5	1	10	4	59

bulimia, bulimia with self-induced vomiting, and kleptophagia seldom accompanied amenorrhoea (3/12) as long as body weight was maintained within a reasonable range.

Disorders in the Cardiovascular System Since physical examinations such as auscultation and chest X-rays were the sole devices to screen cardiovascular disorders, the total of 34 cases which appear in Table 7 might well be underreported. Given that the means of examination were not sophisticated, the largest number of cases (13) falls to congenital heart diseases whether the patient had undergone an operation or not. This was followed by 10 cases of arrhythmia the majority of which were due to ventricular premature contraction. There were a case of ventricular tachycardia among the above 10 which was discovered through syncopic attacks. Only one case of essential hypertension was encountered, while a large proportion of students were found to have been potentially hypotensive. Another case of hypertension was due to SLE nephropathy, hence excluded from the above total though the student was receiving antihypertensive therapy.

Disorders in the Reno-Urinary Tract System Although acute infection in the lower urinary tract was more common among female students than in their male counterparts, the condition was short-lasting in either case. 22 out of a total of 23 cases of reno-urinary tract disorders were cases of chronic nephropathy of various pathologies in which one case of SLE and one case of buli-anorexia were included. The former case underwent dialysis three times per week until graduation. Mild renal insufficiency resulted in the latter case, which was followed for 10 years without observing any improvement¹.

Metabolic and Hormonal Disorders Excluding Amenorrhoea Because students were screened by unsophisticated means, the above disorders were seldom discovered. There was one case of insulin-dependent diabetes mellitus and 5 cases of impaired glucose tolerance. Thyroid diseases found in mass-screening were 9/4, 486 (0.002). The low incidence compared to a recent report from Kagoshima, Japan (0.008)² seems to have been attributable to the scrupulous palpations carried out at the latter university. A case of pituitary acromegaly underwent surgery successfully. Also noted was a single case of Marfan's syndrome which had been diagnosed during her childhood.

Disorders in the Respiratory System Active pulmonary tuberculosis was rare even prior to the 80's, yet of three cases in the cohorts of '81, '83, and '90 were discovered and treated during the 10-year period under observation. One case was found through a mass-screening and the others in daily clinical services. No acid-fast bacilli were detected in the conventional Ziel-Neelsen smear of sputum specimens.

Apart from tuberculosis, there were three cases of bronchial asthma and a single case of sarcoidosis.

Other Disorders of Relative Importance Seven cases of collagen disorders were found throughout the period. Treatment was provided for a single case of SLE elsewhere. Generalized and recurrent atopic dermatitis in three cases required long-term care.

In June 1989, a 2nd-year student was brought to the clinic on the back of her father. She had visited a well-equipped hospital the preceding evening for numb extremities and a slight disturbance in gait. The attending physician suspected hyperventilation syndrome before dismissing her. She developed palsy in her right lower extremity overnight. When examined in the CHC, signs of pyramidal lesion were evident already. A CT study following emergency transfer to another hospital depicted a ϕ 2cm infarction in the left inner capsule. The rare case of juvenile infarction without underlying conditions showed complete recovery after a 6-month rehabilitation.

Student Death Three students died during the period. Causes were: one definite plus one presumed case of suicide and one death due to accident while travelling abroad.

Clues to Discovering Students with Chronic Disorders which Require Long-Term Care An analysis was made to see which approach was more efficient for uncovering cases. Table 11 shows several clues which were identified retrospectively through clinical charts. An overwhelming majority was discovered when the students visited the clinic voluntarily. Those who declared their previous histories by means of health cards were called back to the CHC for confirmative examinations and/or tests. In terms of efficiency, annual mass-screening does not seem satisfactory, though the resultant motivation on the student population can not be ignored. Nine students were brought to our attention through informants, two of whom were the police; the rest were professors, general service staff and friends.

Table 11 Clues to Discovering Students with Chronic Disorders

Clues	Number of students by enrollment cohort										Total	%
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990		
Clinic/CHC visits	15	28	20	15	16	22	15	14	23	26	194	61.8
Self declaration	4	2	7	8	2	9	5	5	4	9	55	17.5
Mass-screening	3	4	1	4	3	2	5	4	3	2	31	9.9
Blood donation	2	2	2	4	1	0	1	0	2	2	16	5.1
Counselor/CHC visits	2	2	1	1	0	0	1	1	1	0	9	2.9
Through informants	0	1	0	0	1	0	3	2	2	0	9	2.9
Total	26	39	31	32	23	33	30	26	35	39	314	100.1

Discussion

There seem to be two major implications of the foregoing report, firstly operational, and secondly epidemiological. These are interrelated.

Much controversy is yet lingering among relevant professionals in Japan regarding the mission of student health services and how to accomplish this mission with relatively small manpower. It is true that ministerial stipulation was rather vague and no technical guidelines whatever have been offered for implementing student health services in national universities. Accordingly, it was only natural that there has been a lot of trial and error during the last 30 years in Japan.

In late 1976, the CHC adopted primary care as its basic operational policy. Reasons for this decision included: 1) there was a potential but strong demand for clinical services on campus; 2) students were found to have been weary of listening to repeated health lectures in classrooms although they were quite health-conscious, even overconscious, where their own health was concerned; 3) by rendering student's access to the CHC easier as well as more beneficial for them, it was thought that the CHC would be in a better position to collect a large amount of health information which was indispensable for campus epidemiology.

The current subject population, 18 to 22 year old females, has been known to possess an extremely low mortality rate in Japan. Nevertheless, they do suffer trivial illnesses frequently. Overcautious students waste many hours at hospitals, whereas diseases in some overly diligent students are aggravated by their having not taken time off to request pertinent care. For example, if an anemic student visits the clinic at 10:00 during a break between classes, she can be examined and her blood drawn for hematological tests. By 16:30, when she is leaving the campus, laboratory data have already been evaluated so that she can leave with medicine free of charge. The same situation applies to employees also. Another important consideration is that when students or employees are free to visit hospitals, most of the medical facilities are already closed. This is especially disturbing as approximately of 60% of students board without family physicians in Tokyo.

In the late 1970s, patients visited the CHC predominantly for convenience and saving time. The campus community came to gradually appreciate the role of the CHC as a primary-care practitioner during the 80s. This is reflected in a significant increase in general consultation and referral services. Statistics from the mid-80s show that roughly 85% of either students or employees had visited the CHC at least once for clinical services.

As noted in the introduction, the CHC has also been responsible for the health care of some 400 employees. Expanding primary-care practices to the employee population is not an easy task, as it is far more disease-prone than that of students. For instance, the average amount of care provided by the CHC clinic per year was 7,434 for students, while it was 2,587 for employees, a figure that is 3 times higher per person. This notwithstanding, health care in the campus community is complete only when teaching/research staff as well as administrative and clerical staff are integrated into the subject population. It should be noted that an appreciable amount of information on student health was made available for the CHC through the employees by the above policy.

Manpower, a combination of one physician and one nurse, was undeniably small, but not necessarily short-handed. On the other hand, it was advantageous in two aspects: a) to enhance concentration of information to a single keyperson, and b) to protect the privacy of the patients.

University students are intelligent and knowledgeable, as well as having access to modern mass media

which are full of health information. Their difficulties are, however, to weigh fragments of information, comprehend situations which they encounter and find out proper ways to cope. It was thought that using case studies of actual doctor-patient consultations would provide a much more fruitful basis for health education than abstract lectures. The purpose of preparing lecture syllabuses by assembling practical questions and answers at the clinic was to keep a continuity between the classroom and the clinic.

As the popularity of the CHC grew and more information became available to it, it became possible to identify students with chronic health problems. The percentage of students with health problems overlooked was modestly estimated at 20% maximum. It should be stressed that 7% of even the healthiest population in Japan possesses some chronic disorders. This fact alone would justify the necessity of good student health services.

Epidemiological analysis by area of disorder is definitely handicapped by a small cohort, though two conclusions seem to be in order. Firstly, both anemia and amenorrhoea were the two most consistently observed disorders in the subject population; and secondly, mental disorders were the most frequent cause for long term care during the period from 1985 to 1989. Incidence among the total population (4,486) was 0.27% and 0.22% for schizophrenia and depression respectively. These incidences bear comparison with those of Tokyo University reported as early as 1964.⁴ In contrast to the stable incidence of the endogenous psychoses, it was eating disorders which increased the overall incidence of mental disorders. Excessive weight consciousness and eating disorders, both of which are phenomena which came to the fore after the late 70s in this university,^{5,6} appear to underlie the high incidence of weight-losing amenorrhoea and eating disorders. The suicide rate (2/4,486) is found to be comparable to that in the corresponding population at large.³ Mental disorders seem to have been behind the two cases of suicide mentioned earlier.

The absence of malignancies in 4,486 students for a 4-year period does not necessarily suggest a low morbidity, since two cases of acute leukemia and a case of thyroid carcinoma have been discovered subsequent to the completion of the present study in the two cohorts which followed.

When the idea of student health services came to the mind of ministry officials, tuberculosis was no longer rampant on Japanese campuses. During the 25 years which followed, the emphasis in student health services moved around various areas from time to time, for example student apathy, eating disorders and the early prevention of metabolic diseases. It would seem doubtful if the basic concept of tuberculosis control in a community is still valid in health services today, taking into consideration the radically changed risk pattern in student population. Because more individualization justifiably appears to be encouraged in the Japanese educational system, perhaps it is time to switch the concept of student health services from simply controlling a mass to caring for students more individually. In this affluent society, Japanese students are in greater need of professional advice than their counterparts three decades ago in order to establish their identity. Nevertheless, they tend to shun any means which are regulatory. In the above context, successful health care in this university based on health care as part of a daily routine help yourself, the door is open would imply a promising approach.

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