

Assessment of health examination outcome of health checkup clients at the Preventive Medicine Clinic, King Chulalongkorn Memorial Hospital

Vitool Lohsoonthorn*

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- Objective** : *To assess health examination outcome of health checkup clients at the Preventive Medicine Clinic.*
- Design** : *Descriptive study.*
- Methods** : *This study was conducted between August and December 1999 by measuring height, weight and blood pressure, recording physical and laboratory outcome and interviewing health checkup clients' characteristics. Data were analyzed for percentage of abnormal findings and tested for association by Chi-square or t-test.*
- Results** : *The results showed that of 900 health checkup clients, 235 were male(26.1 %) and 665 female (73.9 %); 95 % were Buddhist; 24.7 % had a bachelor degree education, 19.4 % ran private business, and 50.9 % had a family income of 10,000 bahts per month or lower. Almost 64.1 % had never undergone a health checkup. The physical and laboratory results showed that 7.5 % were obese, 18.1 % were hypertensive, 6.6 % had diabetic mellitus (with a sharp increase in the age group 40 - 49 years), 48.0 % had high blood cholesterol, and 13.2 % and 31.3 % were anemic in males and females respectively. The association between BMI and sex was statistically significant ($p = 0.016$).*

Conclusion : *Obesity, hypertension, hyperlipidemia and anemia were major health problems in health checkup clients. For further study, these health checkup clients should be followed up for health surveillance.*

Key words : *Health examination, Assessment, Preventive Medicine Clinic.*

Reprint request : Lohsoonthorn V. Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

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วัตถุประสงค์ : เพื่อประเมินผลการตรวจสุขภาพของผู้มารับการตรวจสุขภาพที่คลินิกเวชศาสตร์
ป้องกัน

รูปแบบการวิจัย : การศึกษาเชิงพรรณนา

วิธีการศึกษา : การศึกษานี้ได้ดำเนินการตั้งแต่เดือนสิงหาคมถึงธันวาคม 2542 โดยการวัดส่วน
สูง ซึ่งน้ำหนัก วัดความดันโลหิต บันทึกผลการตรวจร่างกายและการตรวจทาง
ห้องปฏิบัติการ สัมภาษณ์ข้อมูลทั่วไปของผู้มารับการตรวจสุขภาพวิเคราะห์ข้อมูล
หาร้อยละของความผิดปกติและทดสอบหาความสัมพันธ์ระหว่างตัวแปรโดยการ
ทดสอบไคสแคว์หรือการทดสอบที่ตามความเหมาะสม

ผลการศึกษา : ผลการศึกษาพบว่าผู้มารับการตรวจสุขภาพ 900 ราย เป็นเพศชาย 235 คน
(ร้อยละ 26.1) เพศหญิง 665 คน (ร้อยละ 71.9) นับถือศาสนาพุทธ ร้อยละ 95.0
จบการศึกษาระดับปริญญาตรีและสูงกว่าร้อยละ 24.7 มีอาชีพประกอบธุรกิจ
ส่วนตัวมากที่สุดร้อยละ 19.4 รายได้ของครอบครัวต่อเดือน 10,000 บาทหรือ
น้อยกว่า ร้อยละ 50.9 ไม่เคยตรวจสุขภาพร้อยละ 63.5 ผลการตรวจสุขภาพพบ
มีดัชนีมวลกายอยู่ในเกณฑ์อ้วนร้อยละ 7.5 ความดันโลหิตสูง ร้อยละ 18.1 ตรวจ
เลือดพบเป็นโรคเบาหวานร้อยละ 6.6 โดยเริ่มพบมากในกลุ่มอายุ 40 - 49 ปีขึ้นไป
มีไขมันคลอเลสเตอรอลอยู่ในเกณฑ์สูง ร้อยละ 48.0 มีภาวะโลหิตจางในเพศชาย
ร้อยละ 13.2 เพศหญิงร้อยละ 31.3 พบมีความสัมพันธ์ทางสถิติในเชิงบวกระหว่าง
ตัวแปรดัชนีมวลกายและอาหารที่มีไขมันสูง

สรุป : ความอ้วน ความดันโลหิตสูง ไขมันในเลือดสูง และ ภาวะโลหิตจางเป็นปัญหา
สุขภาพอนามัยที่สำคัญของผู้มารับการตรวจสุขภาพ ในการศึกษาต่อไป ควรจะ
ได้มีการติดตามเฝ้าระวังภาวะสุขภาพอนามัยของประชากรกลุ่มนี้

Health examination is a procedure of examination by a physician customarily including past and present medical history, a complete physical examination, and selected laboratory or special tests. The health examination may be performed annually or at other regular times (Periodic health examination). The periodic health examination is an early detection procedure in asymptomatic, supposedly well persons with the objective of establishing a medical database aimed at detecting disease in its early asymptomatic state. It is also undertaken to determine the risks of subsequent disease development.⁽¹⁻⁶⁾

What should be included in the annual or periodic health examination? Some hospitals require several days to complete a routine examination, whereas some hospitals require a few hours to complete an annual checkup. The costs of the annual or periodic health examination vary according to the number and type of the tests. The significance of some of the deviations from the normal physical or laboratory examination yields tangible benefits that outweigh its costs.

Interest in annual or periodic health examination programs is increasing. The annual and periodic health examination program have been performed by Preventive Medicine Clinic, King Chulalongkorn Memorial Hospital for many years. There still has not been an assessment of a health checkup outcome or establishment of health checkup database. To develop a productive and successful health examination program, there should be a higher level of sensible health practice and research.

The purpose of this study was to assess the health examination outcome of health checkup clients at the Preventive Medicine Clinic.

Materials and Methods

The research design in this study was descriptive. The study population was health checkup clients at the Preventive Medicine Clinic on their first visit, age 15 years and over during August to December 1999. Total sampling was done for 900 clients. All health checkup clients were measured for height, body weight and blood pressure. The physical and laboratory examination outcomes were recorded. The health checkup clients were interviewed for general characteristics: age, sex, marital status, education, occupation etc. Data were analyzed by SPSS for Windows for percentage of abnormal findings and tests for association by Chi-square or t-tests. The body mass index was calculated by body weight per body surface area.

$$\text{BMI} = \text{Weight/height}^2 \text{ (Kg/m}^2\text{)}$$

The body mass index was classified by WHO criterion:⁽⁷⁾

- | | |
|----------------|---------------------|
| 1. Underweight | BMI less than 20.00 |
| 2. Normal | BMI 20.00-24.99 |
| 3. Overweight | BMI 25.00-29.99 |
| 4. Obesity | BMI 30.00 and over |

The blood pressure was classified according to The Fifth Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure (JNC V):^(8,9)

	Systolic BP	Diastolic BP
	mm Hg	mm Hg
1. Normal	< 140	< 90
2. Mild hypertension	140 - 159	90 - 99
3. Moderate hypertension	160 - 179	100 - 109
4. Severe hypertension	180 - 209	110 - 119
5. Very severe hypertension	210 and over	120 and over

Results

The results showed that of 900 health checkup clients were 235 male (26.1 %) and 665 female (73.9 %) as shown in Table 1. The general characteristics of health checkup clients are shown in Table 2. 61.8 % were married, 95.0 % were Buddhist; 19.4 % ran private business. A family income of 10,000 baths per month or lower was recorded in 50.9 %. The percentage of clients who had never been for a previous health checkup was 63.5 %. The rate of obesity in females (8.7 %) was higher than in males (3.8 %) but the overweight (BMI 25 -25.99) in males was higher than in females (Table 3). The rate of hypertension increased with age. The incidence mild and moderate hypertension was 17.0 %. The incidence of abnormal fasting blood sugar level (FBS) 126 mg/dl and over was 6.6 %. The incidence of abnormal FBS increased in the age group 40 - 49 years and over as shown in table 5. Abnormal BUN>20 and Cr>2 mg/dl

were found in only 5 persons (0.6 %). This suggested some renal pathology (Table 6). The abnormal uric acid level (>7.0 mg %) was more common in males (21.3%) than in females (3.3 %) as shown in Table 7. The distribution of SGPT level by age is shown in Table 8. There was no definite variation with age. The incidence of a one-fold abnormal level (39 - 76) was 12.5 % and of a two-fold abnormal level (>76) was 3.1%. Abnormal serum cholesterol (221-299 mg/dl) was found in 42.2 %, while the abnormal serum cholesterol 300 mg/dl and over was found in 5.8 % (Table 9). The rate of abnormal triglyceride levels (156-299 mg/dl) was 17.5 % while the higher abnormal level (300 mg/dl and over) was found in 3.6 % (Table 10). The rate of HDL-Cholesterol \geq 50 mg/dl was higher in females (69.0%) than in males (38.1 %). (Table 11). The anemia in females (Hb <12 g/dl) 31.3 % was higher than in males (13.2 %) and this difference was statistically significant, $p < 0.001$ (Table 12).

Table 1. Number and percent of health checkup clients by age and sex.

Age group	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
< 20 Yr.	4	0.4 %	9	1.0 %	13	1.4 %
20 – 29 Yr.	40	4.4	96	10.7 %	136	15.1 %
30 – 39 Yr.	64	7.1 %	156	17.3 %	220	24.4 %
40 – 49 Yr.	54	6.0 %	199	22.1 %	253	28.1 %
50 – 59 Yr.	30	3.3 %	132	14.7 %	162	18.0 %
60 – 69 Yr.	33	3.7 %	62	6.9 %	95	10.6 %
\geq 70 Yr.	10	1.1 %	11	1.2 %	21	2.3 %
Total	235	26.1 %	665	73.9 %	900	100.0 %

Table 2. General characteristics of health checkup clients at Preventive Medicine Clinic.

General characteristics	Number	Percent
1. Marital status (n = 900)		
Single	236	26.2
Married	556	61.8
Widowed	64	7.1
Other	44	4.9
2. Religion (n = 900)		
Buddhist	855	95.0
Other	5	5.0
3. Education (n = 898)		
Lower than grade 4	69	7.7
Primary education (Grade 4)	332	37.0
Secondary education	160	17.8
Pre-university	115	12.8
Bachelor degree and higher	222	24.7
4. Occupation (n = 898)		
Housewives	246	27.4
Private business	174	19.4
Private servant	156	17.4
Government officials	99	11.0
5. Family income per month (n = 794)		
10,000 baht and lower	404	50.9
10,001 - 20,000 baht	177	22.3
20,001 - 30,000 baht	88	11.1
30,001 and higher	125	15.8
6. Previous health examination (n = 899)		
Have never been checkup	571	63.5

Table 3. Number and percent of health checkup clients ' body mass index by sex.

Sex	Body Mass Index				Total
	Underweigh	Normal	Overweight	Obesity	
Male	40 17.0 %	116 49.4 %	70 29.8 %	9 3.8 %	235 100.0 %
Female	138 20.8 %	315 47.5 %	152 22.9 %	58 8.7 %	663 100.0 %
Total	178 19.8 %	431 48.0 %	222 24.7 %	67 7.5 %	898 100.0 %

Chi-square test = 10.31 (p = 0.016)

Table 4. Number and percent of health checkup clients ' blood pressure by age.

Age	Levels of blood pressure				Total
	Normal (SBP<140 and DBP<90)	Mild Hypertension (SBP 140-159 or DBP 90-99)	Moderate hypertension (SBP 160-179 or DBP 100-109)	Severe hypertension (SBP 180-209 or DBP 110-119)	
< 20 Yr.	11 84.6 %	1 7.7 %	1 7.7 %	0 0.0 %	13 100.0 %
20 - 9 Yr.	129 95.6 %	6 4.4 %	0 0.0 %	0 0.0 %	135 100.0 %
30 - 39 Yr.	198 90.0 %	18 8.2 %	3 1.4 %	1 .5 %	220 100.0 %
40 - 49 Yr.	222 88.1 %	24 9.5 %	5 2.0 %	1 .4 %	252 100.0 %
50 - 59 Yr.	110 67.9 %	38 23.5 %	13 8.0 %	1 .6 %	162 100.0 %
60 - 69 Yr.	53 55.8 %	30 31.6 %	10 10.5 %	2 2.1 %	95 100.0 %
≥ 70 Yr.	12 57.1 %	7 33.3 %	2 9.5 %	0 0.0 %	21 100.0 %
Total	735 81.8 %	124 13.8 %	34 3.8 %	5 .6 %	898 100.0 %

Table 5. Number and percent of health checkup clients ' fasting blood sugar (FBS) by age.

Age	Fasting blood sugar (FBS) mg/dl			Total
	Normal (< 110)	IFG* (110-125)	≥ 126	
< 20 Yr.	11 91.7 %	1 8.3 %	0 0.0 %	12 100.0 %
20 - 29 Yr.	131 97.0 %	3 2.2 %	1 .7 %	135 100.0 %
30 - 39 Yr.	206 94.1 %	10 4.6 %	3 1.4 %	219 100.0 %
40 - 49 Yr.	220 87.0 %	16 6.3 %	17 6.7 %	253 100.0 %

Table 5. Continuous.

Age	Fasting blood sugar (FBS) mg/dl			Total
	Normal (< 110)	IFG* (110-125)	≥ 126	
50 - 59 Yr.	123 75.9 %	14 8.6 %	25 15.4 %	162 100.0 %
60 - 69 Yr.	58 61.7 %	23 24.5 %	13 13.8 %	94 100.0 %
≥ 70 Yr.	16 76.2 %	5 23.8 %	0 0.0 %	21 100.0 %
Total	765 85.4 %	72 8.0 %	59 6.6 %	896 100.0 %

* IFG = Impaired Fasting Glucose

Findings	n	Mean	Median	S.D.	Minimum	Maximum	P ₂₅	P ₇₅
FBS	896	103.83	96.00	39.04	62	661	90.00	103.00

Table 6. Number and percent of health checkup clients' blood urea nitrogen (BUN) and Creatinine (Cr) by age.

Age	Levels of Blood Urea Nitrogen (BUN) และระดับ Creatinine (Cr)				Total
	BUN < 20 and Cr < 2	BUN > 20 and Cr < 2	BUN < 20 and Cr > 2	BUN > 20 and Cr > 2	
< 20 Yr.	12 100.0 %	0 0.0 %	0 0.0 %	0 0.0 %	12 100.0 %
20 - 29 Yr.	132 100.0 %	0 0.0 %	0 0.0 %	0 0.0 %	132 100.0 %
30 - 39 Yr.	215 98.6 %	3 1.4 %	0 0.0 %	0 0.0 %	218 100.0 %
40 - 49 Yr.	250 98.8 %	1 .4 %	0 0.0 %	2 .8 %	253 100.0 %
50 - 59 Yr.	157 96.9 %	5 3.1 %	0 0.0 %	0 0.0 %	162 100.0 %
60 - 69 Yr.	87 92.6 %	4 4.3 %	1 1.1 %	2 2.1 %	94 100.0 %
≥ 70 Yr.	19 90.5 %	1 4.8 %	0 0.0 %	1 4.8 %	21 100.0 %
Total	872 97.8 %	14 1.6 %	1 .1 %	5 .6 %	892 100.0 %

Table 7. Number and percent of health checkup clients 'uric acid by age and sex.

Age	Levels of Uric acid (mg/dl)					
	Male		Female		Total	
	> 7.0 mg/dl	Total	> 7.0 mg/dl	Total	> 7.0 mg/dl	Total
< 20 Yr.	2 66.7 %	3	1 11.1 %	9	3 25.0 %	12
20 - 29 Yr.	4 10.3 %	39	0 0.0 %	91	4 3.1 %	130
30 - 39 Yr.	9 14.3 %	63	3 1.9 %	154	12 5.5 %	217
40 - 49 Yr.	16 29.6 %	54	5 2.5 %	198	21 8.3 %	252
50 - 59 Yr.	5 17.2 %	29	8 6.1 %	132	13 8.1 %	161
60 - 69 Yr.	10 31.3 %	32	4 6.5 %	62	14 14.9 %	94
≥ 70 Yr.	3 30.0 %	10	1 9.1 %	11	4 19.0 %	21
Total	49 21.3 %	230	22 3.3 %	657	71 8.0 %	887

Findings	n	Mean	Median	S.D.	Minimum	Maximum	P ₂₅	P ₇₅
Uric acid	887	4.865	4.600	1.489	1.8	10.8	3.800	5.700

Table 8. Number and percent of health checkup clients ' SGPT (ALT) by age.

Age	SGPT (ALT)			Total
	0-38	39-76	> 76	
< 20 Yr.	11 84.6 %	2 15.4 %	0 0.0 %	13 100.0 %
20 - 9 Yr.	118 88.7 %	11 8.3 %	4 3.0 %	133 100.0 %
30 - 39 Yr.	184 84.0 %	28 12.8 %	7 3.2 %	219 100.0 %
40 - 49 Yr.	210 84.3 %	29 11.6 %	10 4.0 %	249 100.0 %

Table 8. Continuous.

Age	SGPT (ALT)			Total
	0-38	39-76	> 76	
50 - 59 Yr.	134 82.7 %	25 15.4 %	3 1.9 %	162 100.0 %
60 - 69 Yr.	80 85.1 %	13 13.8 %	1 1.1 %	94 100.0 %
≥ 70 Yr.	15 71.4 %	3 14.3 %	3 14.3 %	21 100.0 %
Total	752 84.4%	111 12.5%	28 3.1%	891 100.0%

Findings	n	Mean	Median	S.D.	Minimum	Maximum	P ₂₅	P ₇₅
SGPT	891	26.47	20.00	28.44	2	413	13.00	30.00

Table 9. Number and percent of health checkup clients ' cholesterol by age.

Age	Levels of Cholesterol (mg/dl)			Total
	Normal (≤ 220)	221-299	> 300	
< 20 Yr.	9 75.0 %	3 25.0 %	0 0.0 %	12 100.0 %
20 - 29 Yr.	98 73.1 %	35 26.1 %	1 .7 %	134 100.0 %
30 - 39 Yr.	134 61.5 %	76 34.9 %	8 3.7 %	218 100.0 %
40 - 49 Yr.	127 50.4 %	117 46.4 %	8 3.2 %	252 100.0 %
50 - 59 Yr.	52 32.1 %	89 54.9 %	21 13.0 %	162 100.0 %
60 - 69 Yr.	36 38.3 %	45 47.9 %	13 13.8 %	94 100.0 %
≥ 70 Yr.	8 38.1 %	12 57.1 %	1 4.8 %	21 100.0 %
Total	464 52.0 %	377 42.2 %	52 5.8 %	893 100.0 %

Findings	n	Mean	Median	S.D.	Minimum	Maximum	P ₂₅	P ₇₅
Cholesterol	893	222.60	218.00	46.16	83	483	191.00	250.00

Table 10. Number and percent of health checkup clients ' triglyceride by age.

Age	Levels of Triglyceride (mg/dl)			Total
	Normal (≤ 155)	156-299	> 300	
< 20 Yr.	12 100.0 %	0 0.0 %	0 0.0 %	12 100.0 %
20 - 29 Yr.	128 95.5 %	6 4.5 %	0 0.0 %	134 100.0 %
30 - 39 Yr.	190 87.6 %	24 11.1 %	3 1.4 %	217 100.0 %
40 - 49 Yr.	205 81.3 %	39 15.5 %	8 3.2 %	252 100.0 %
50 - 59 Yr.	101 62.3 %	50 30.9 %	11 6.8 %	162 100.0 %
60 - 69 Yr.	57 60.6 %	28 29.8 %	9 9.6 %	94 100.0 %
≥ 70 Yr.	11 52.4 %	9 42.9 %	1 4.8 %	21 100.0 %
Total	704 78.9 %	156 17.5 %	32 3.6 %	892 100.0 %

Findings	n	Mean	Median	S.D.	Minimum	Maximum	P ₂₅	P ₇₅
Triglyceride	892	117.90	94.00	81.66	27	940	68.25	141.00

Table 11. Number and percent of health checkup clients ' HDL-Cholesterol by age and sex.

Age		Levels of HDL-Cholesterol (mg/dl)			Total
		< 35 mg/dl	35-49 mg/dl	≥ 50 mg/dl	
< 20 Yr.	Male	1 (33.3 %)	2 (66.7 %)	0 (0.0 %)	3 (100.0 %)
	Female	1 (11.1 %)	1 (11.1 %)	7 (77.8 %)	9 (100.0 %)
20 - 29 Yr.	Male	1 (2.6 %)	12 (30.8 %)	26 (66.7 %)	39 (100.0 %)
	Female	1 (1.1 %)	29 (31.2 %)	63 (67.7 %)	93 (100.0 %)
30 - 39 Yr.	Male	8 (12.5 %)	34 (53.1 %)	22 (34.4 %)	64 (100.0 %)
	Female	5 (3.2 %)	32 (20.8 %)	117 (76.0 %)	154 (100.0 %)
40 - 49 Yr.	Male	6 (11.3 %)	30 (56.6 %)	17 (32.1 %)	53 (100.0 %)
	Female	7 (3.5 %)	52 (26.3 %)	139 (70.2 %)	198 (100.0 %)
50 - 59 Yr.	Male	2 (6.7 %)	19 (63.3 %)	9 (30.0 %)	30 (100.0 %)
	Female	7 (5.3 %)	40 (30.3 %)	85 (64.4 %)	132 (100.0 %)

Table 11. Continuous.

Age		Levels of HDL-Cholesterol (mg/dl)			Total
		< 35 mg/dl	35-49 mg/dl	≥ 50 mg/dl	
60 - 69 Yr.	Male	4 (12.5 %)	16 (50.0 %)	12 (37.5 %)	32 (100.0 %)
	Female	3 (4.8 %)	20 (32.3 %)	39 (62.9 %)	62 (100.0 %)
≥ 70 Yr.	Male	1 (10.0 %)	7 (70.0 %)	2 (20.0 %)	10 (100.0 %)
	Female	0 (0.0 %)	6 (54.5 %)	5 (45.5 %)	11 (100.0 %)
Total	Male	23 (10.0 %)	120 (51.9 %)	88 (38.1 %)	231 (100.0 %)
	Female	24 (3.6 %)	180 (27.3 %)	455 (69.0 %)	659 (100.0 %)

Findings	n	Mean	Median	S.D.	Minimum	Maximum	P ₂₅	P ₇₅
HDL-C	890	54.38	53.00	13.69	8	117	44.00	63.00

Table 12. Number and percent of health checkup clients ' Hemoglobin (Hb) by age. and sex.

Age		Levels of hemoglobin		
		Abnormal	Normal *	รวม
< 20 Yr.	Male	1 (25.0 %)	3 (75.0 %)	4 (100.0 %)
	Female	5 (55.6 %)	4 (44.4 %)	9 (100.0 %)
20 - 29 Yr.	Male	5 (12.5 %)	35 (87.5 %)	40 (100.0 %)
	Female	30 (31.6 %)	65 (68.4 %)	95 (100.0%)
30 - 39 Yr.	Male	6 (9.4 %)	58(90.6 %)	64 (100.0 %)
	Female	46 (30.1 %)	107 (69.9 %)	153 (100.0 %)
40 - 49 Yr.	Male	6 (11.3 %)	47 (88.7%)	53 (100.0%)
	Female	66 (33.8 %)	129 (66.2%)	195 (100.0%)
50 - 59 Yr.	Male	2 (6.7 %)	28 (93.3 %)	30 (100.0 %)
	Female	39 (29.8 %)	92 (70.2 %)	131 (100.0 %)
60 - 69 Yr.	Male	5 (15.2 %)	28 (84.8 %)	33 (100.0 %)
	Female	18 (29.0%)	44 (71.0 %)	62 (100.0%)
≥ 70 Yr.	Male	6 (60.0 %)	4 (40.0 %)	10 (100.0 %)
	Female	1 (11.1 %)	8 (88.9 %)	9 (100.0 %)
Total	Male	31 (13.2 %)	203 (86.8 %)	234 (100.0 %)
	Female	205 (31.3 %)	449 (68.7 %)	654 (100.0 %)

* Normal hemoglobin level Female = 12 -16 g/dl, Male = 13-18 g/dl

Discussion

The percentage of health checkup clients who had never undergone a previous health checkup was relatively high (63.5 %). Patients in the age group 40 years and over should have had at least one health checkup. Those in the age group 60 years and over may require a health checkup annually. The First edition of the US Preventive Service Task Force Guide recommends that patients aged 19 to 64 years have a periodic health examination every 1 to 3 years and those older than 64 years have a periodic health examination every year.⁽¹⁰⁾ The factors influencing optimal frequency of health examination include patient or client's age, occupation and hazardous environmental exposure, past medical history and personal health behavior.⁽¹¹⁻¹³⁾ The rate of obesity in this study was 7.5 % which was higher than the First National Health Examination Survey (4.0%).⁽¹⁴⁾ In both studies obesity in females was more common than in males. The rate of systolic hypertension was 14.7 % and of diastolic hypertension was 7.9 %. Either systolic or diastolic hypertension was found in 18.1 %. This figure was slightly lower than that reported in the Hypertension Survey at District Kogesamrong, Lopburi (19.7 %).⁽¹⁵⁾ Both used the same definition of hypertension. Fasting blood sugar 126 mg/dl and over in two consecutive examinations indicates diabetes mellitus. The incidence of abnormal FBS at this level was 6.6 % in a single examination. The number of patients with abnormal BUN >20 and Cr >2 was quite small (0.6 %). A high BUN level is related to a high protein diet and dehydration. A high Cr level indicates abnormal renal function. It is economically efficient to

examine Cr alone instead of both BUN and Cr. The incidence of abnormal uric acid in age group less than 20 years was high (25.0 %). This may be due to the eating-out behavior of the teenagers. The incidence of abnormal SGPT (>76) was 3.1 %. Values higher than three times normal indicate hepatocellular damage. The rate of abnormal serum cholesterol (221-299 mg/dl) in this study was 42.2 % while in the Second National Health Examination Survey was only 34.4 %.⁽¹⁶⁾

Conclusion

The assessment of health examination outcome of 900 health checkup clients at the Preventive Medicine Clinic, King Chulalongkorn Memorial Hospital was conducted between August and December 1999 by recording physical and laboratory outcome and interviewing health checkup clients characteristics. Sixty-three point five percents had never undergone for health checkup. Obesity, hypertension, hyperlipidemia and anemia were major health problems of health checkup clients.

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