

## Child's Body Temperature Determination by Mothers

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### ABSTRACT

This study is the product of a questionnaire to mothers of nursery school children. It analyses the present situation of children's temperature determination by mothers.

These points were made clear:

1. Virtually all of the mothers using mercury thermometers and about 80 percent of the mothers using digital thermometers took axillary temperature.
2. About 60 percent of the mothers using mercury thermometers took the temperature for 5 minutes and about 20 percent for 3 minutes.
3. About 80 percent of the mothers said they knew their own child's normal temperature. About 60 percent of the mothers placed the normal temperature between 36.0°C and 36.4°C.
4. More than 80 percent of the mothers went to medical clinics when their own child's temperature was between 37.0°C and 38.4°C. About half of the mothers went to see a doctor when their own child's temperature was in the 37.0 to 37.9°C range.
5. Problems identified were the confusion of the length of temperature determination time because of the spread of digital thermometers and because of the lack of appropriate instructions for using thermometers.

### INTRODUCTION

There are few studies about temperature determination at home. Accordingly, we investigated the actual conditions of small children's temperature determination by mothers. Our survey of mothers with small children shows that body temperature is the indicator of health most used at home<sup>1)</sup>. Mothers tend to take their child's temperature as soon as the child shows reduced energy or appetite; then, they decide whether to see

a doctor or not. We were interested in how mothers view the temperature.

## METHODS

The subjects of this study were the parents of 956 infants and small children attending 14 nursery schools in T City. A questionnaire was taken home from each school by each child and brought back after it was filled out by the parents. The survey was conducted in mid-July, 1984. Respondents remained anonymous. The response rate was 89.6% (857). Such a rate is very high. We analyzed only the 750 nursery school questionnaires filled out by *mothers of 3 to 6 year olds* in order to decrease the influence of age differences.

## RESULTS

### 1. Retention of thermometers

Table 1 shows that 99.5 percent of the mothers had thermometers at home. 73.1 percent had mercury thermometers, 6.0 percent had digital, and 20.4 percent had both mercury and digital.

Table 2 shows how mothers who had both mercury and digital thermometers measured temperature. 49.0 percent used both mercury and digital, 33.3 percent used only digital, and 5.9 percent used only mercury.

**Table 1. Retention Rate of Clinical Thermometers**

	N=750	Number (%)
Only Mercury Thermometer		548 (73.1)
Both Mercury and Digital Thermometer		153 (20.4)
Only Digital Thermometer		45 ( 6.0)
No Answer		4 ( 0.5)

**Table 2. Use of Digital and Mercury Thermometers  
by Mothers Who Have Both**

	N=153	Number (%)
Both Mercury and Digital Thermometer		75 (49.0)
Only Digital Thermometer		51 (33.3)
Only Mercury Thermometer		9 ( 5.9)
Not Clear		18 (11.8)

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2. Methods of temperature determination

As shown in Table 3, 97.8 percent of the mothers using mercury thermometers took axillary temperature, 78.5 percent of the mothers using digital thermometers took axillary temperature, and 17.8 percent of the mothers using digital took oral temperature.

As shown in Table 4, the mothers using digital thermometers took less time than mothers using mercury thermometers did.

Table 3. Method for Temperature Determination

		Number (%)					
T. Type	Method	Axillary	Oral	Axillary & Oral	Other	No Answer	Total
		Mercury Thermometer	620 (97.8)	8 ( 1.3)	4 ( 0.6)	0 ( 0.0)	2 ( 0.3)
Digital Thermometer	145 (78.5)	33 (17.8)	5 ( 2.7)	1 ( 0.5)	1 ( 0.5)	185 (100.0)	

Table 4. Length of Time for Body Temperature Determination

		Total Number (%)			
Length of Time		1 ~ 4 minutes	5 ~ 9 minutes	more than 10 minutes	No Answer
Mercury	n=678	159 (23.5)	443 (65.3)	44 ( 6.5)	32 ( 4.7)
Digital	n=204	129 (63.3)	47 (23.0)	1 ( 0.5)	27 (13.2)

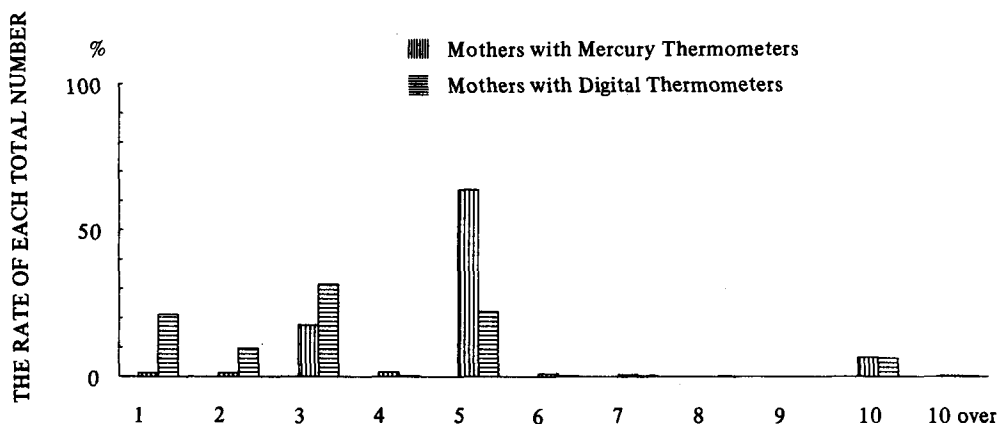


Fig. 1 The Length of Time of Body Temperature Determination at Home (minutes)

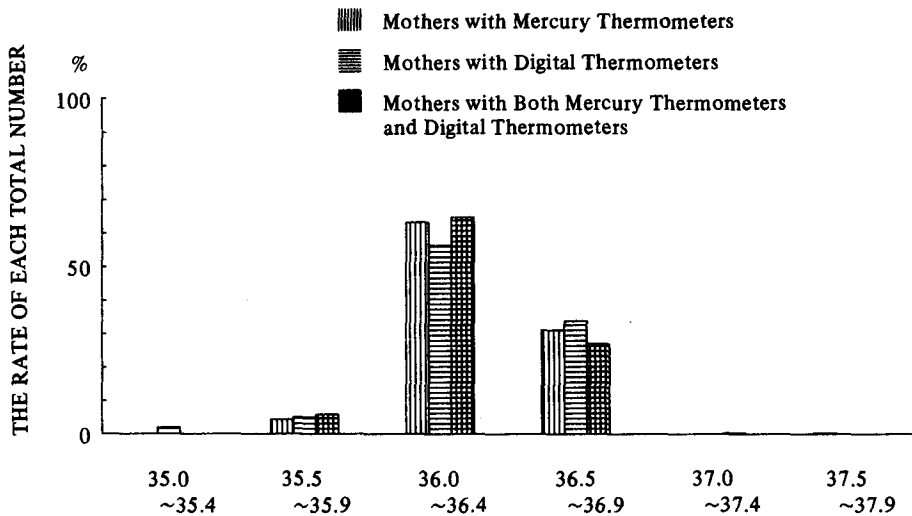
Figure 1 shows that 63.6 percent of the mothers using mercury thermometers took 5 minutes. 18.3 percent took 3 minutes, and 6.5 percent took more than 10 minutes. 32.4 percent of the mothers using digital thermometers took 3 minutes. 21.6 percent took 5 minutes, and 20.1 percent took 1 minute.

**3. Cognizance of mother's own child's normal temperature**

81.7 percent of the mothers said that they knew their own child's normal temperature (Table 5). Figure 2 shows that there is little temperature difference between mercury and digital thermometers. About 60 percent of the mothers placed their child's normal temperature between 36.0°C and 36.4°C, about 30 percent placed it between 36.5°C and 36.9°C, and only 5 percent placed it below 36.0°C.

**Table 5. Cognizance of Mothers Own Child's Normal Temperature**

	N=750	Number (%)
Cognizant		613 (81.7)
Incognizant		110 (14.7)
No Answer		27 ( 3.6)



**Fig. 2 Mothers Cognizance of Their Own Child's Normal Temperature (°C)**

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4. Standard temperature for seeing a doctor

81.2 percent of the mothers always check body temperature in order to judge whether or not to see a doctor (Table 6). As shown in Figure 3, the largest group took their child to the doctor if the temperature was above 38.0 to 38.4°C. The next largest group went at above 37.0 to 37.4°C, followed closely by 37.5 to 37.9°C. 51.9 percent of the mothers went to see a doctor if the temperature was in the 37.0 to 37.9°C range. In addition, as shown in Table 7, there was no relationship between cognizance of the child's normal temperature and use of the temperature in deciding whether or not to see a doctor.

Table 6. Does the Mother Use Body Temperature as a Standard for Going to the Doctor ?

	N=750	Number (%)
Yes		609 (81.2)
No		111 (14.8)
No Answer		30 ( 4.0)

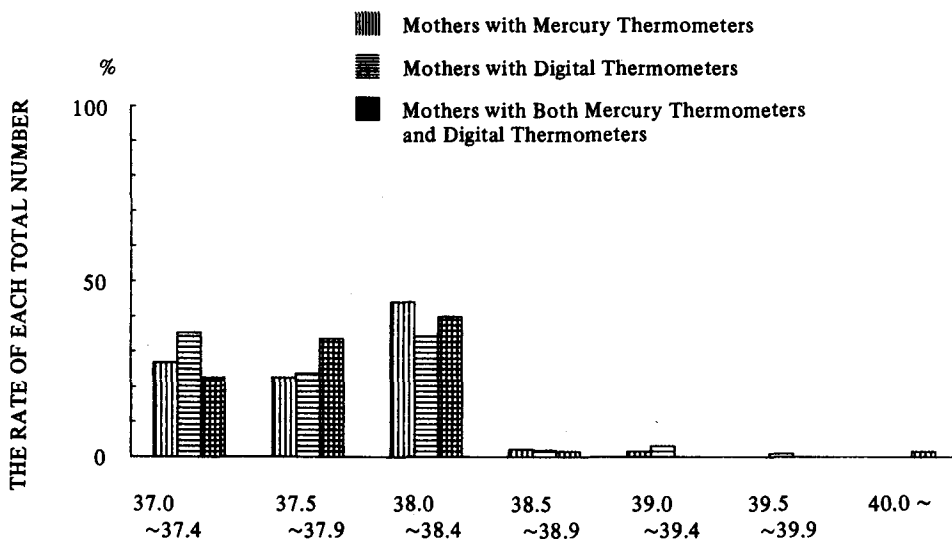


Fig. 3 Standard Body Temperature for Going to see a Doctor (°C)

**Table 7. Cognizance of Normal Temperature and Practical Use\* of Present Body Temperature**

		N=750			Number (%)
Present temperature	Use	Do Not Use	Not Clear	Total	
	Normal temperature				
Cognizant	526 (85.8)	76 (12.4)	11 ( 1.8)	613 (100.0)	
Incognizant	89 (80.9)	18 (16.4)	3 ( 2.7)	110 (100.0)	
Not Clear	13 (48.1)	7 (25.9)	7 (25.9)	27 (100.0)	

\* Practical use refers to using the temperature to judge whether or not to visit a doctor.

## DISCUSSION

The retention rate of thermometers at home in this study was higher than that of the Survey of National Health<sup>2)</sup>, which was 91.5 percent. Importantly, digital thermometers have begun to be widely used among families. According to the authors' 1978 survey of Aichi Prefecture hospitals, only 4.5 percent of the outpatient clinics and 21.2 percent of the wards used digital thermometers<sup>3)</sup>.

Compared with the spread of oral temperature determination in Western countries, axillary temperature determination has been general in our country. However, the percentage using the oral method rose somewhat with digital thermometers. 5-minute determination by mercury and 3-minute determination by digital was most practiced by mothers. It appears that the mothers were following the directions that come with the thermometers.

Although 80 percent of the mothers thought they knew their own child's normal temperature, it was lower than that in the medical books<sup>4)</sup>. This may be caused by the shortness of the determination time.

Digital thermometers can be divided into two types. One is the direct indication type, and the other is the inference type. The direct type needs more than 10 minutes to take an accurate temperature, as does a mercury thermometer<sup>5)</sup>. The inference type, in spite of the shortness of the required time of temperature determination, might not be always measure the temperature accurately.

It seems that the required time is confused because of the spread of digital thermometers. In spite of the emphasis on body temperature, proper instruction for taking temperatures is insufficient.

Mothers should be instructed that they need to measure temperature for more than 10 minutes, except when using inference-type thermometers. This is especially true when taking the temperature at important times, such as when they want to know if their child is slightly feverish before an inoculation.

The largest group of the mothers would take their child to a doctor when the temperature was 38.0°C to 38.4°C. However, because about 50 percent of the mothers set the 37.0 to 37.9°C range as the standard temperature to see a doctor, it could be concluded that mothers tend to rely on the doctor rather than watch the change of their own child's condition.

## CONCLUSION

Mothers in this study kept thermometers at home and recognized the normal temperature as a health management tool. However, the temperature which mothers mentioned as the normal temperature was low, perhaps because of the shortness of the temperature determination time. Although the proper measurement time is still a matter of debate<sup>6)</sup>, it has become even more complicated because of the spread of digital thermometers. Accordingly, it is necessary for medical agencies and people to educate, orally and in writing, parents on how to take temperatures properly with the various types of thermometers.

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