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Medical Malls: Assessing Willingness to Consult and Services Anticipated

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Abstract

Japan's aging and declining population has weakened the financial basis of local government. With most public hospitals being deficit operations, medical resources are deteriorating. This study investigates medical malls as a means to realize concentrated urban health care services and reduce the financial burden on local governments. Medical mall refers here either to a single building or to a designated area in which multiple, independently managed clinics and pharmacies are located. This study undertook an online poll of 563 people to assess the feasibility of using medical malls to concentrate health care services in urban areas. There were seven major findings. Approximately 40% of the polled residents were aware of medical malls; around 20% had attended a mall for a medical consultation. Ninety percent of residents had a positive attitude towards medical malls. Respondents' "level of interest regarding medical care" and whether or not they had a "consultation history at a medical mall" were the two main factors that affected their motivation towards attending medical malls. Those residents with higher levels of interest in medical care also revealed an explicit willingness to undergo a consultation at a medical mall at a rate 1.5 times higher than that of residents with a low level of interest. Those who had actually attended a consultation at a medical mall were also 1.5 times more motivated to do so again than those with no history of consultation. However, even those with experience visiting medical malls were less motivated to undergo further consultations to the extent that they had less interest in medical care. Many residents emphasized the importance of medical malls being located close to public transportation and shopping facilities, compared with proximity to other services.

Keywords: Medical malls; Willingness to consult; Anticipated services; Public attitudinal survey; Concentrated urban health care services

Introduction

Japan guarantees all its nationals universal health care and free access and is known to show medical performance at the world highest levels [1]. However, the general annual revenue account of the government incurs national medical expenses of approximately 40 trillion yen to 54 trillion yen; and the medical resources of the government are now under pressure [2]. Diversification and the population decline due to the low birthrate and aging provide the background to these problems in meeting medical needs. In particular, in local cities, the population of productive age has significantly decreased and aging is progressing. The resultant declining tax revenues have financially weakened local governments. Furthermore, most public hospitals are chronic deficit operations; many have gone bankrupt and closed down due to doctor shortages and inadequate clinical departments. The medical resources of local governments require tightening to make up for the deficit operation of these hospitals to ensure sustainability. As of 2014, the number of clinics in the whole country was 11.6 times the number of hospitals, with more than 100,000 clinic facilities against approximately 8,600 hospitals. Since Japan has a population of about 120 million, one medical facility will serve approximately 1,200 residents [3]. Therefore, to maintain a sustainable regional health care system without increasing taxes, effective utilization of existing clinics, rather than adding hospitals, is preferable.

In this situation, many local governments are promoting more compact urban designs as a response to Japan's declining population [4]. One related initiative gaining attention as an effective means to revitalize both local areas and health care is the grouping of integrated health care services in urban cores by locating hospitals close to train stations in city centers [5]. Clustering hospitals together, however, generates huge relocation costs and is possible only within a small number of regional cities with adequate financial reserves and economies of scale. Accordingly, there is a need to find new means of integrating health care services in urban cores without creating any unreasonable financial burdens. This paper considers medical malls as a means to achieve this as an alternative to hospitals.

A medical mall is used here to refer to either a single building or a designated area in which multiple, independently managed clinics and pharmacies are located, providing effective and efficient health care services [6]. Additionally, seen from the perspective of medical practitioners, the higher capacity of medical malls to attract patients may also contribute to the stability of health care businesses [7]. From the patient's perspective, medical malls come with the same array of medical clinics as hospitals, which allows them to undergo consultation and testing from multiple specialists in one step. Other advantages include shorter waiting times and improved access to medical services [8].

Such advantages for both medical practitioners and patients mean that medical malls are worthwhile as centers of integrated medical care facilities within urban cores. As a result, however, a number of corporations are now developing medical malls in a haphazard fashion, with between 70 to 100 new medical malls having opened in the space of one year [9]. As a result, some medical malls have not been able to attract the expected number of patients, leading to cases of developer bankruptcy, malls aborted in the planning stages, and others forced to close their doors [10,11]. These cases highlight the need to put in place appropriate development strategies, based on a firm grasp of the needs of residents, so that medical malls are utilized effectively. Nonetheless,

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medical malls are not defined under Japan's Medical Care Act and research on them is limited due to the absence of official statistical materials [12,13].

Surveys show that in the West, primary care doctors are tending to form group practices with three or more practitioners [14]. Cooperation among several doctors to treat cases increases the reported effectiveness and quality of medical care [15]. Medical office buildings and medical mall management schemes are being deployed across the United States along the lines of the large-scale Mayo Clinic [16,17]. Similar models may develop in future in Japan as circumstances change.

Accordingly, in order to establish the possibilities that arise from concentrating medical services within urban cores by way of medical malls, an attitudinal survey of the general public was designed and implemented in order to ascertain people's willingness to undergo consultations at medical malls, as well as the kinds of services they expected to find there.

The features of medical malls in Japan

As described above, "medical mall" is used here to refer either to a single building or a designated area in which multiple, independently managed clinics and pharmacies are located, providing effective and efficient health care services. Table 1 clarifies the differences between buildings and medical malls from the point of view of the residents of medical malls [6].

First, floors in commercial buildings may hold multiple businesses such as banks, convenience stores, hair salons, etc., in addition to clinics. On the other hand, medical mall tenants are limited to clinics and pharmacies; they will operate as a medical-only floor in a building. Second, there are no dedicated information points for medical services in multi-tenant buildings, as are found in medical malls. Third, in a multi-tenant building, each clinic requires its own waiting room space. Medical malls feature shared spaces (lounges, children's spaces, toilets, parking, etc.) Fourth, patient identity cards and payment services are not shared in multi-tenant buildings; in contrast, these are generally shared at medical malls. Patients who have to consult various specialists benefit from shared identity cards. Fifth, patient referral partnerships do not arise in multi-tenant buildings, but can be formed in medical malls. However, to enhance cooperation, an installation coordinator should manage such interventions and referrals. Treatment referrals for patients may be inadequate in medical malls that lack such coordination. Permission to set up such medical malls depends on local government regulations, because the discretionary authority lies with the local government Table 1.

	multi-tenant building	medical mall
In-floor configuration	Bank, convenience store, beauty salon, etc., tenants	Limited to the clinic and pharmacy as a medical floor.
Installation of General Information	×	○
Sharing of space, such as waiting rooms	×	△
Sharing of the examination card and payment service	×	△
Other clinics and care coordination	×	△

Table 1: The differences between multi-tenant buildings and medical malls in Japan.

Methodology

In general, a minimum of 2000 samples is necessary to carry out a public opinion poll of Japanese citizens, but it is difficult to perform such a large-scale national investigation with budget limitations. Therefore, in this study, try a pilot study utilizing the monitor of an online survey company.

For the present survey, a sample size of 500 is set as a response target from amongst approximately 1 million individuals registered with an online survey company, extracted according to certain conditions. I assume a precision of 95% of sample size, a sampling error of ±5%. With regard to information ethics, the international ISO/IEC 27001 and JISQ15001 standards of information security management were requested of the research agency, due to the built-in safeguards of these standards; the agency had acquired "privacy mark" certification in conformity with the requirements of these compliance programs with regard to the protection of personal information. The quality of response data is guaranteed through thorough checking to prevent duplicate registrations and to detect and handle fraudulent responses.

Responses are divided into five groups of people in their 20s, 30s, 40s, 50s, and 60s, each accounting for 20% of the overall sample. The number of surveys sent to each residential region (hereafter, "region") largely matches the distribution of the population in each of the Japanese prefectures. Surveys are sent to those who had answered in the affirmative to a previous questionnaire carried out to identify respondents with actual experience undergoing a consultation at a medical institution.

First, information is collected in regard to 12 different variables relating to the following respondent attributes: age, age group (e.g., from 20s-60s), sex, presence of children, region, degree of interest in the health care system or medical institutions (hereafter, "interest in health care"), medical institution most regularly attended (hereafter, "primary medical institution"), consultation frequency, occupation, income, awareness of medical malls, and consultation history at a medical mall. Respondents indicated their level of interest in health care by selecting from "5. I have an interest," "4. I have an interest to some extent," "3. I have an average amount of interest," "2. I do not have much interest," and "1. I have no interest." Respondents who selected either 5 or 4 were grouped together under "high interest," those who selected 3 are classified as a "medium interest" group, and those who selected either 2 or 1 are grouped under "low interest." Information on respondent income and consultation frequency is collected using the National Survey Questionnaire prepared by the Japan Medical Association Research Institute as a guide. While respondents gave simple yes or no answers in regard to their "awareness" of and "consultation history" at medical malls, "willingness to consult" (i.e., respondents' desire and intention to undergo a medical consultation) was identified using contingent valuation methodology (CVM) [18]. The question items used in an online investigation are as follows.

Q1. "The facilities (called 'medical malls' below) that act as shopping malls for medical care may be located around a station square, a commercial building, or a suburban shopping mall; have you encountered a form such as this medical mall recently?"

Q2. "Do you want to use this kind of medical mall for any illness or health problem? Please answer with a relative score on the 100-point scale below Figure 1."

Based on these questions, after defining "Willingness to Consult: WTC," a 100-point linear analog scale is used. As an overall basis for evaluating willingness to consult, scores are categorized into separate groups as follows: "0-20 points: Not willing," "20-40 points:

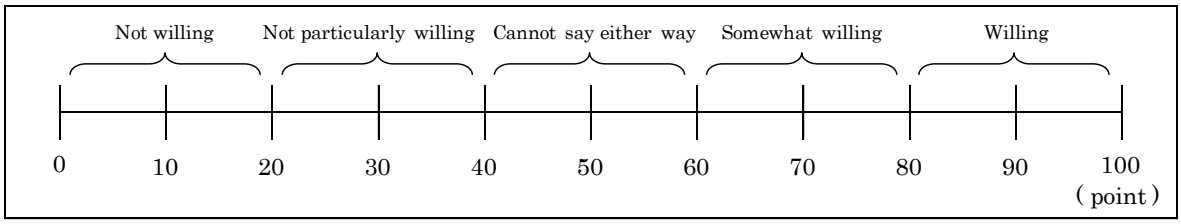


Figure 1: WTC responses table.

Not particularly willing," "40-60 points: Cannot say either way," "60-80 points: Somewhat willing" and "80-100 points: Willing." Thus, respondents scoring 60 points or above can be considered as having a definite willingness to undergo a medical consultation at a medical mall. These respondents are defined as "WTC 60" under the criteria for evaluating willingness to consult.

Closed scientific definitions and terms are not used in the actual questionnaire, which is intended for general inhabitants, not necessarily patients consulting a medical institution; this approach lowers the risk of answer refusals. For simplicity, a 100-point scale rather than a Likert scale is adopted. Subjects tend to understand this formulation better intuitively.

Second, in order to establish the relationships between these 12 variables and the WTC, chi-square testing or ANOVA was used to carry out cross tabulation.

Third, distribution function analysis is carried out using WTC to identify the effects of the size of "interest in health care" and "consultation history." Distribution functions are shown by the curves indicating a cumulative percentage along the x-axis from the lowest to highest variable values. Values on the y-axis indicate the area of probability distribution, while those on the x-axis indicate WTC. The shape of this function expresses the probability distribution. These distribution functions are used for their stability with unique data; statistics derived from distribution functions are also extremely stable [19]. Japan uses distribution information in decision-making in fields such as medical fees and health planning. This lengthy process involves many interested parties, such as doctors, medical staff, patient groups, citizens, and researchers; facilitating this discussion in easy-to-understand ways is desirable.

Fourth, respondents' level of interest in health care and their consultation history at medical malls are considered for their influence on the kinds of services that respondents anticipated at medical malls. Following the examples of previous studies, 14 service items are presented to respondents [20-22]. Fifth, results of this analysis are used in order to clarify the level of awareness held by the general public with regard to medical malls, the extent to which they have attended medical malls in the past, their willingness to do so (again), and the types of services they anticipate seeing at medical malls. Finally, the potential for utilizing medical malls to concentrate health care services in urban cores is considered, along with some questions for future research.

Results

Respondent attributes and willingness to consult at medical malls

The survey was distributed to 563 people, of which 547 people participated, a response rate of 97.2%. Of these, 27 people (4.8%) had never undergone a consultation at a medical institution and were excluded from the analysis, leaving a total of 536 responses, a valid response rate of 95.2%.

First, results of the analysis of respondent attributes are shown in Table 2. The average respondent age was 45.2, with a standard deviation of 13.7. There was almost no difference in size amongst each of the five age groups. The largest age group was that of respondents in their 60s (111 people or 20.7%), followed by those in their 40s (110 people of 20.5%), while the smallest was that of respondents in their 20s (97 people or 18.1%). The male/female ratio was balanced with 268 male and 268 female respondents. With regard to parental status, 274 respondents (51.1%) had children, slightly more than the 262 people (48.9%) who did not. The most common response to the question regarding medical consultation frequency was "More than once every 6 months" (157 people, or 29.3%), followed by "More than once per month" (129 people, or 24.1%). The least common response to the same question was "More than once per week" (24 people, or 4.5%). In other words, a little over 30% of respondents attended a medical facility more than once per month. With regard to income, the largest income group was "Between 3 million and 5 million yen" (133 people, or 24.8%), followed by "Between 5 million and 8 million yen" (117 people, or 21.8%). The smallest income group was "Between 8 million and 10 million yen" (57 people, or 10.6%). Note that 72 people (13.4%) declined to answer this question. In response to a question about their awareness of medical malls, 217 people (40.5%) indicated they were aware, and 319 (59.5%) indicated they were unaware of the existence of medical malls. Hence, around 40% of respondents had heard of medical malls. Furthermore, respondents who had a consultation history at a medical mall numbered 111 people (20.7%), roughly the percentage as those who did not, at 106 (19.8%).

Survey results thus show that 40.5% of respondents were aware of the existence of medical malls, while 20.7% had actually undergone a medical consultation at a medical mall Table 2.

Second, chi-square or ANOVA testing was used to perform cross tabulation on the 12 previously mentioned variables and WTC in order to identify factors that affected respondent willingness to undergo medical consultation at a medical mall. The average value for WTC across the entire sample was 61, with a standard variation of 17.53, indicating that the majority of respondents were clearly willing to do so. In addition, the two variables that showed a statistically significant difference from WTC were "level interest in health care" and "use history" (of a medical mall) ($p < 0.000$ and $p < 0.000$). If we consider "level of interest in health care," the average value of WTC for those considered to have a "high interest" was 64.2 with a standard deviation of 18.07, followed by those with a "medium interest" at 59.1 with a standard deviation of 16.01, and finally those considered as having "low interest" at 56.4 with a standard deviation of 15.08. Those with an "unknown" level of interest recorded an average WTC of 52.9, with a standard deviation of 4.09. Thus, willingness to undergo a consultation at a medical mall increased as the respondent's level of interest in health care increased.

				WTC			*p*-value
		n	(%)	Average	(SD)	Range	
Total		536	(100.0)	61.0	(17.53)	0-100	
Age (Years) Average (SD) Range		45.2	(13.68)	20-69[1)]			
Age group							
	20s	97	(18.1)	62.2	(19.48)	0-90	0.772[2)]
	30s	109	(20.3)	60.0	(17.25)	0-100	
	40s	110	(20.5)	59.9	(16.62)	10-100	
	50s	109	(20.3)	60.7	(15.75)	20-100	
	60s	111	(20.7)	62.3	(18.69)	10-100	
Gender							
	Male	268	(50.0)	60.1	(17.88)	0-100	0.245[2)]
	Female	268	(50.0)	61.9	(17.16)	0-100	
Children							
	Yes	274	(51.1)	61.9	(17.64)	0-100	0.192[2)]
	No	262	(48.9)	60.0	(17.39)	0-100	
Region							
	Hokkaido	30	(5.6)	61.7	(18.77)	0- 90	0.924[3)]
	Tohoku	33	(6.2)	61.7	(15.94)	15- 90	
	Kanto	225	(42.0)	60.5	(16.20)	19-100	
	Chubu	77	(14.4)	63.2	(19.07)	0-100	
	Kinki	101	(18.8)	60.8	(18.43)	2-100	
	Chugoku	20	(3.7)	58.3	(21.60)	15- 90	
	Shikoku	15	(2.8)	63.3	(15.43)	40-90	
	Kyushu	35	(6.5)	59.3	(19.33)	10-100	
Level of interest in health care							
	High	257	(47.9)	64.2	(18.07)	0-100	0.000[3)]
	Middle	185	(34.5)	59.1	(16.01)	15-100	
	Low	87	(16.2)	56.4	(15.08)	0-100	
	Unknown	7	(1.3)	52.9	(4.09)	50- 60	
Primary medical institution							
	Clinic	201	(37.5)	59.8	(17.58)	0-100	0.167[3)]
	Hospital	325	(60.6)	62.0	(17.54)	0-100	
	Unknown	10	(1.9)	54.0	(14.30)	20- 70	
Consultation frequency							
	Once a week or more	24	(4.5)	63.8	(22.23)	10-100	0.396[3)]
	Once every 2-3 weeks or more	34	(6.3)	59.6	(17.50)	20- 90	
	Once a month or more	129	(24.1)	59.2	(18.24)	15-100	
	Once every six months or more	157	(29.3)	63.3	(18.80)	0-100	
	Once a year or more	82	(15.3)	61.7	(15.28)	20- 90	
	Once every three years or more	43	(8.0)	60.3	(14.81)	10- 90	
	Once every three years or less	67	(12.5)	58.6	(15.16)	0-100	
Occupation							
	Government employee	18	(3.4)	61.7	(18.55)	20- 90	0.278[3)]
	Manager/Executive	18	(3.4)	57.8	(18.88)	20- 90	
	Office worker (Administration)	75	(14.0)	63.1	(16.52)	2-100	
	Office worker (Technical)	65	(12.1)	58.7	(18.31)	0-100	
	Office worker (Other)	48	(9.0)	63.6	(17.50)	20- 90	
	Business owner	39	(7.3)	57.6	(20.06)	10-100	
	Self employed	13	(2.4)	51.2	(19.38)	20- 95	
	Full-time homemaker	105	(19.6)	61.9	(16.49)	0-100	
	Part-time/Casual worker	54	(10.1)	64.1	(14.51)	40- 90	
	Student	25	(4.7)	58.2	(20.69)	19- 90	
	Other	76	(14.2)	60.9	(17.61)	15-100	
Income							
	Less than 3 million yen	102	(19.0)	58.6	(18.18)	10-100	0.338[3)]
	3 million - 5 million yen	133	(24.8)	60.1	(17.09)	0-100	
	5 million - 8 million yen	117	(21.8)	63.8	(17.33)	10-100	
	8 million - 10 million yen	55	(10.3)	61.0	(21.03)	0- 90	
	More than 10 million yen	57	(10.6)	62.2	(16.01)	20-100	

	Unanswered[4]	72	(13.4)	60.6	(15.80)	19- 95	
Awareness of medical malls							
	Aware	217	(40.5)	62.5	(18.08)	0-100	0.106[2]
	Unaware	319	(59.5)	60.0	(17.10)	0-100	
Consultation history at medical malls							
	Experienced	111	(20.7)	68.0	(16.15)	2-100	0.000[2]
	Inexperienced	106	(19.8)	56.7	(18.24)	0-100	
	Unknown	319	(59.5)	60.0	(17.10)	0-100	

1. Indicates respondents were aged between 20 and 69.
2. Via chi-square testing.
3. Via ANOVA.
4. Includes those who declined to answer this item.

Table 2: Respondent attributes and WTC.

Results indicate an 11.3 point difference in average WTC between those with and without a history of undergoing a medical consultation at a medical mall. Those who were "experienced" with medical malls recorded an average WTC of 68, with a standard variation of 16.15, while those who were "inexperienced" had an average WTC of 56.7, with a standard variation of 18.24. Accordingly, willingness to use medical malls was clearly higher amongst those who had experienced them previously compared with those who had not.

Effects of levels of interest in health care and consultation history on WTC

Distribution function analysis using WTC was carried out in order to clarify the effects of levels of interest in health care on a respondent's willingness to consult. Results are shown in Figure 2. The line representing the "high interest" group is furthest to the right, while the middle line represents the "medium interest" group and the line to the left represents the "low interest" group, indicating that willingness to undergo medical consultation at a medical mall increases the higher one's interest in health care. It should be noted that the distributions begin to separate markedly at WTC 40, which is due to the fact the around 12% of respondents recorded a WTC score of less than 40 as seen under consult frequency in Table 1; this is connected with the 12.5% of respondents who essentially do not attend any medical facility. That is to say, for a little over 10% of these respondents there is almost no likelihood of their attending a medical mall.

Comparing the groups at the "WTC 60" threshold, 56.8% of the "high interest" group occurs after this point, followed by 39.5% of the "medium interest" group and 28.7% of the "low interest" group. The difference between the high and medium interest group was thus 17.3 points, with 28.1 points between the high and low interest groups. This shows that many respondents with an obvious willingness to undergo consultations at a medical mall were those with a high interest in health care. Roughly twice the number of people in the high interest group had a WTC of 60 or above compared with those in the low interest group.

Figure 3 shows the results of distribution function analysis using WTC in order to clarify the effects of respondent histories of consultation at medical malls on their willingness to undergo (further) consultations. The line furthest to the right corresponds to the group of respondents "experienced" in attending a medical mall, while the line furthest to the left represents those "without experience." The middle line represents "other" respondents. The figure indicates that those with a previous history of attendance at a medical mall tend to have a higher WTC. At the WTC 60 threshold, 64.9% of the "experienced" group occurred after this point, followed by 37.7% of the "inexperienced" group and 41.3% of "other" respondents. This results in a difference of 27.2 points between those groups with and without experience of medical malls, and 23.6 points between those with and other respondents. The willingness to attend a consultation at a medical mall of those with a previous history of doing so was thus around 1.5 times that of those without such experience (Figure 2 and 3).

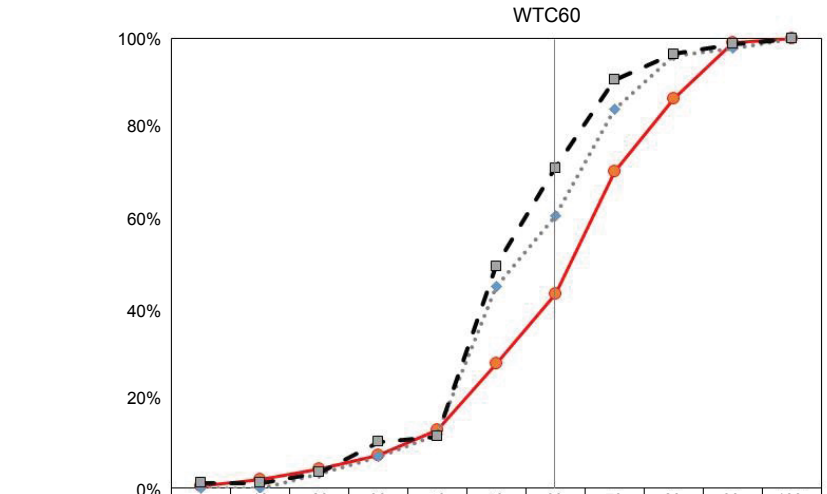
While the basic statistics only catch a snapshot of group characteristics, this approach is able to provide new information-the characteristics and tendency of a group-by comparing groups using the probability distributions.

Anticipated services at medical malls

Table 3 shows the results of a comparative analysis of 14 service-related questionnaire items carried out in order to establish the kinds of services respondents anticipated from medical malls. Overall, respondents tended to emphasize access to public transportation and shopping more than the integration of services at medical malls. The top five service-related items selected by respondents, in order, were as follows: "Direct connection to the closest public transportation station/stop" (selected by 178 respondents or 38.4%); "Public transportation, e.g., loopline buses" (140 respondents or 30.2%); "Osteopathic/massage clinics" (112 respondents or 24.1%); "Located inside a shopping mall" (117 respondents or 25.2%); and "Supermarkets/convenience stores" (104 respondents or 22.4%). Conversely, the lower ranked items overall were "Located on the same site as a nursing home/aged care facility" and "Childcare/kindergarten services" (both with 53 respondents or 11.4%), while the lowest ranked item was "Beauty salons/barber shops" (38 people or 8.2%).

Comparative analysis of anticipated services amongst groups defined by their level of interest in health care reveals that those with a low level of interest were interested in different types of services compared with the other two groups. Groups with high and medium interest in health care ranked "Direct connection to the closest public transportation station/stop" most highly, while the most selected response amongst those of low interest was "None in particular." Nonetheless, the second most selected item by this latter group was also "Direct connection to the closest public transportation station/stop," highlighting the importance to respondents of easy access via public transportation. Furthermore, considering that the item "None in particular" was the third most selected amongst the medium interest group and the most selected by the low interest group, it is clear that lower interest in health care tended to be associated with an absence of preferences regarding services associated with medical malls.

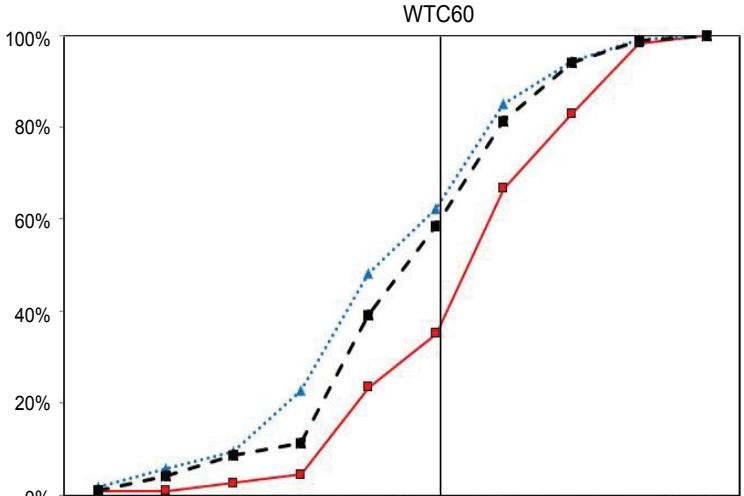
Finally, the ranking of service related items according to groups defined by their experience of attending a consultation at a medical mall (or lack thereof) was as follows. Each of the three groups ranked



	0	10	20	30	40	50	60	70	80	90	100
High Interest	0.4%	1.9%	4.3%	7.4%	12.8%	27.6%	43.2%	70.4%	86.8%	99.2%	100%
Medium Interest	0%	0%	3.2%	7.0%	11.9%	44.9%	60.5%	84.3%	96.2%	97.8%	100%
Low Interest	1.1%	1.1%	3.4%	10.3%	11.5%	49.4%	71.3%	90.8%	96.6%	98.9%	100%

Note: Numbers of people in each group according to their levels of interest in health care were as follows: High = 257, Middle = 185, Low = 87. This excludes 7 respondents for whom interest levels were not known.
Note: WTC 60: Proportion of respondents recording a WTC of 60 points or above = 100- (Cumulative ratio at 60 points)

Figure 2: Distribution function of WTC according to levels of interest in health care.



	10	20	30	40	50	60	70	80	90	100
Experienced	0.9%	0.9%	2.7%	4.5%	23.4%	35.1%	66.7%	82.9%	98.2%	100%
Inexperienced	1.9%	5.7%	9.4%	22.6%	48.1%	62.3%	84.9%	94.3%	99.1%	100%
Other	0.9%	4.1%	8.8%	11.3%	39.2%	58.6%	81.2%	94.0%	98.7%	100%

Note: Experienced = 257, Inexperienced = 106, Other (unknown) = 319
Note: WTC 60: Proportion of respondents recording a WTC of 60 points or above = 100-(Cumulative ratio at 60 points)

Figure 3: Distribution function of WTC according to respondent previous experience of consultation at medical malls

"Direct connection to the closest public transportation station/stop" and "public transportation, e.g., loop line buses" in first and second position, respectively, while the "Other" group selected "None in particular" in third place.

These results suggest that many of the respondents attached more importance to ease of access to public transportation and shopping than the addition of beauty/barber services, childcare, catering, or nursing care services to medical malls. In particular, less than 20% of respondents were eager to see medical malls attached to multiple dwelling complexes or with hospital-style patient admissions. Moreover, respondents who were unaware of the existence of medical malls, or who were uninterested in health care more generally, were

more likely to express no preference with regard to services or features of medical malls Table 2.

Discussion

The attitudinal survey described above was conducted in order to consider the feasibility of medical malls as a way to concentrate health care services in urban cores. Four possibilities emerging from the survey results are discussed here.

First, approximately 40% of respondents were aware of the existence of medical malls and around 20% had attended a consultation at a medical mall in the past. This suggests that medical malls are in fact widely familiar amongst the general public, despite the fact that medical malls are a novel form of business that has emerged rapidly since 2000 and are overwhelmingly outnumbered by hospitals and health care clinics. This recognition may be accounted for by the fact that medical malls are often located in highly visible areas with comparatively higher levels of pedestrian and vehicular traffic, such as those adjacent to public transport stations/stops, close to large hospitals, or within large suburban shopping malls. As medical malls include multiple facilities such as clinics and pharmacists, their external appearance is much more noticeable compared with individual clinics. As they have a similar visual impact to that of hospitals, it should be possible to increase preferences amongst the general public for medical malls by locating them in easily accessible areas.

Second, the results indicate that 90% of people may seek a consultation at a medical mall in the event that they experience some type of health related problem. Indeed, the average WTC of the entire survey sample was 61, above the threshold indicative of a definite willingness to attend a consultation at a medical mall. Accordingly, a potential need can be said to exist amongst the general public in relation to medical malls.

Third, the two factors that affected one's willingness to undergo a consultation at a medical mall were "level of interest in health care" and "consultation history at a medical mall." Age, region, occupation, income, consultation frequency, and the primary medical institution attended by respondents had no impact on willingness to attend a medical mall.

Fourth, those with experience of having attended a consultation at a medical mall in the past as well as a high level of interest in health care clearly have a more definite and strong willingness to do so again. If we consider the proportions of those indicating a clear willingness to consult at a medical mall, those with a higher level of interest in health care were approximately 1.5 and 2 times more numerous than those with a medium or low level of interest in health care. Thus, a higher level of interest in health care was associated with a higher likelihood of undergoing a consultation at a medical mall. Also, if we look at those with and without a history of consultation at medical malls, those with such experience accounted for approximately 60% of the total number of respondents indicating a high willingness to consult, 1.5 times more than those who had never done so previously and who made up the remaining 40% of this figure. Therefore, medical malls, as centers around which to concentrate health care services, should be targeted at members of the general public with a higher level of interest in health care.

Fifth, members of the public with a history of having been treated at a medical mall also showed a clear willingness to consult at a medical mall again. Of respondents who indicated a clear willingness to consult at a medical mall, those with experience of such facilities accounted for approximately 60%, 1.5 times more than those without such experience, who accounted for around 40%.

Sixth, while willingness to consult increased alongside one's interest in health care and having a history of having been treated at a medical mall, those with a low interest in health care showed a lower willingness to consult, regardless of their experience of these facilities.

Seventh, in terms of the sorts of services that might be anticipated in connection with medical malls, respondents tended to emphasize the need for easy access to public transportation and shopping facilities. Respondents were not necessarily concerned with having integrated childcare, nursing, beauty/barber, or related health care facilities as components of medical malls, having medical malls located on the same site as multiple dwelling complexes, or having medical malls provide hospital-style patient admissions. Respondents within the groups here labeled as "other" or "low interest" tended to indicate no particular preference in regard to medical mall services. This is not likely to be because these respondents indicate satisfaction with the existing types of services at medical malls, but rather because they have little interest in and are unaware of medical malls and selected this response through a process of elimination. Accordingly, taking these results into account, any new development of medical malls should focus on locating them in areas with easy access to public transportation and shopping facilities. For example, any lack of transportation between residential areas and medical malls could be addressed by providing community buses in order guarantee transport access and the ability for people to receive health care at any given time. In addition, ensuring close proximity of facilities to allow people to receive health care and do shopping in one trip is also critical. If such conditions are fulfilled, many people are likely to have a higher preference for medical malls as health care centers within urban cores. Nonetheless, if people are mostly interested in access to public transportation and shopping opportunities, why should this apply only to medical malls and not also to hospitals and medical clinics? Two possibilities are considered below.

First, in relation to hospitals, it is clear that a portion of the general public primarily is seeking medical treatment at hospitals. This is also evident from the roughly 20% of respondents seen in Table 3 who indicated a preference for "patient admissions as per hospitals" to be available at medical malls. Nonetheless, many local governments in Japan are losing their financial footing, as the population continues to decline [23]. For this reason, only a limited number of main cities with sufficient financial reserves and economies of scale are able to relocate or attract hospitals from suburban areas to urban centers. In terms of sustainability and feasibility, then, utilizing frameworks such as those provided by medical malls may be more desirable than constructing new hospitals. For example, in the cities of Ashiya in Hyogo Prefecture and Kamiishi in Iwate Prefecture, some hospital outpatient facilities have been moved to medical malls due to physician shortages and the closure of some hospital departments [24,25].

The second possibility relates to medical clinics. It is possible to achieve a concentration of medical care facilities in a downtown area simply by locating multiple clinics in a central urban area with good access to transportation. While it is said that 80% of health problems can be dealt with via primary care, many patients still prefer to be seen at a hospital even in the case of minor ailments such as a cold, or to undergo examinations at multiple institutions [26]. It has been argued that ease of access is the primary motive behind the commonly encountered preference for large hospitals [27]. Accordingly, locating medical clinics in areas with ample transport and commercial facilities may partially solve this issue. However, standardizing patient identification cards and consultation records amongst facilities within a medical mall, as already occurs within hospitals, would do away with duplicate billing, clinical tests, diagnostic imaging, and excess drug administration.

By level of interest in health care	Overall			High interest			Medium interest			Low interest		
	n=487	(%)	Rank	n=238	(%)	Rank	n=172	(%)	Rank	n=77	(%)	Rank
Direct connection to closest public transportation station/stop	184	(37.8)	1	106	(44.5)	1	56	(32.6)	1	22	(28.6)	2
Public transportation e.g. loopline buses	149	(30.6)	2	83	(34.9)	2	50	(29.1)	2	16	(20.8)	4
Located inside a shopping mall	120	(24.6)	3	73	(30.7)	3	29	(16.9)	6	18	(23.4)	3
Osteopathic/massage clinics	116	(23.8)	4	66	(27.7)	4	39	(22.7)	4	11	(14.3)	5
Supermarkets/convenience stores	108	(22.2)	5	61	(25.6)	5	39	(22.7)	4	8	(10.4)	7
None in particular	101	(20.7)	6	29	(12.1)	14	40	(23.3)	3	32	(41.6)	1
Patient admissions as per hospitals	92	(18.9)	7	58	(24.4)	7	26	(15.1)	7	8	(10.4)	7
Other health related facilities [2]	87	(17.9)	8	53	(22.3)	8	26	(15.1)	7	8	(10.4)	7
Home nursing/day services	84	(17.2)	9	61	(25.6)	5	17	(9.9)	11	6	(7.8)	10
Located on same site as a multiple dwelling/apartment complex	69	(14.2)	10	41	(17.2)	9	19	(11.0)	9	9	(11.7)	6
Restaurants or catering services	65	(13.3)	11	40	(16.8)	10	19	(11.0)	9	6	(7.8)	10
Located on same site as a nursing home/aged care facility	55	(11.3)	12	39	(16.4)	11	10	(5.8)	13	6	(7.8)	10
Childcare/kindergarten services	54	(11.1)	13	37	(15.5)	12	13	(7.6)	12	4	(5.2)	13
Beauty salons/barber shops	38	(7.8)	14	31	(13.0)	13	6	(3.5)	14	1	(1.3)	14
By consultation history at medical malls (As above)	Overall (As above)			Experienced			Inexperienced			Other		
	n=487	(%)	Rank	n=108	(%)	Rank	n=96	(%)	Rank	n=283	(%)	Rank
Direct connection to closest public transportation station/stop	184	(37.8)	1	41	(38.0)	1	44	(45.8)	1	99	(35.0)	1
Public transportation e.g. loopline buses	149	(30.6)	2	29	(26.9)	2	39	(40.6)	2	81	(28.6)	2
Located inside a shopping mall	120	(24.6)	3	28	(25.9)	4	36	(37.5)	3	56	(19.8)	5
Osteopathic/massage clinics	116	(23.8)	4	29	(26.9)	2	26	(27.1)	5	61	(21.6)	4
Supermarkets/convenience stores	108	(22.2)	5	27	(25.0)	5	27	(28.1)	4	54	(19.1)	7
None in particular	101	(20.7)	6	21	(19.4)	8	12	(12.5)	12	68	(24.1)	3
Patient admissions as per hospitals	92	(18.9)	7	16	(14.8)	10	21	(21.9)	6	55	(19.4)	6
Other health related facilities [2]	87	(17.9)	8	21	(19.4)	8	19	(19.8)	7	47	(16.6)	8
Home nursing/day services	84	(17.2)	9	23	(21.3)	7	19	(19.8)	7	42	(14.8)	9
Located on same site as a multiple dwelling/apartment complex	69	(14.2)	10	26	(24.1)	6	12	(12.5)	12	31	(11.0)	11
Restaurants or catering services	65	(13.3)	11	11	(10.2)	13	18	(18.8)	9	36	(12.7)	10
Located on same site as a nursing home/aged care facility	55	(11.3)	12	9	(8.3)	14	15	(15.6)	11	31	(11.0)	11
Childcare/kindergarten services	54	(11.1)	13	16	(14.8)	10	17	(17.7)	10	21	(7.4)	13
Beauty salons/barber shops	38	(7.8)	14	12	(11.1)	12	7	(7.3)	14	19	(6.7)	14

1. Multiple responses
2. "Other health related facilities" here refers to hot springs (spas) and fitness clubs.

Table 3: Anticipated services associated with medical malls.

This would vastly reduce the amount paid at the counter, compared with having patients attend consultations at multiple clinics. Thus, measuring the level of internal cooperation within medical malls will be an important task from the general public's point of view, though in reality medical malls that have such internal arrangements are said to be exceedingly few [28].

In any case, medical malls and clusters of unconnected medical clinics may both be able to function as centers of concentrated health care facilities in urban cores that are equipped to replace the function of hospitals. It is not possible to determine which of these two options is preferable merely on the basis of the present survey results; however, this should be considered by future researchers, as they utilize further survey analyses.

Conclusion

We can see that medical malls are indeed highly appealing to members of the public and provide definite motivation in terms of their willingness to be treated at such a facility. Provided they are located so as to provide good access to public transportation and shopping opportunities, they are more likely than not to gain acceptance by the public as centers of concentrated health care services in urban cores.

In Japan, as aging progresses and the population decreases, the number of areas where it is difficult to maintain civic functions and social infrastructure is increasing. A stable population and sustainable tax and health care fund savings are required in such circumstances. For these purposes, urban planning is increasingly based on compact cities and the strengthening of infrastructure and amenities. Therefore, this study allows health care policy to link with city planning; concentrated urban health care services need to reflect inhabitants' needs. The provision of medical malls may then be of greater benefit than the placing of public hospitals. Good medical services can be provided at low expense by using private medical practitioners effectively. The financial burden on local governments is greatly reduced when compared with the costs of constructing new public hospitals. This is not superficial profit-seeking on the part of health care providers, but an important policy to facilitate local development. Models such as the medical mall are worth investigating, given that many Western countries have agonized over the problems of aging and population decreases in particular; budget deficits necessitate careful choices in the direction of future health care policy.

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