Factors that influence the choice of seeking treatment at polyclinics

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INTRODUCTION Patients in Singapore can choose their primary care provider on a per-episode basis and pay out-of-pocket for services rendered. The infrastructure of subsidised and private primary care sector facilities differs. Onsite ancillary services are available in subsidised facilities, allowing for convenience of routine investigations, while private clinics are usually standalone practices. This study sought to examine the factors influencing patients' choice of polyclinic.
METHODS This was a cross-sectional survey of a convenient sample of 484 random patients who sought treatment at a polyclinic located in a new housing estate from 24–27 June 2008.
RESULTS The response rate was 85.4% (n = 409). 38.1% of the patients were male. Mean age was 36.2 years. Only 13.8% had a regular private family physician, while 37.3% were followed up at polyclinics. Patients on regular polyclinic follow-up were more likely to be older ($p < 0.001$), unemployed, retirees or housewives ($p < 0.001$) and were seeking treatment for chronic diseases ($p < 0.001$). Geographical convenience ($p = 0.002$), low cost of consultation ($p = 0.024$), and onsite laboratory ($p = 0.001$) and imaging services ($p = 0.018$) significantly influenced those on regular polyclinic follow-up to attend the polyclinic.
CONCLUSION Affordability, convenience of travel and onsite laboratory facilities influence patients' choice of seeking treatment at polyclinics. Further research examining whether the overall convenience of onsite ancillary services influences patients' choice of primary care provider would be useful in redesigning private primary care infrastructure to enhance patient convenience and encourage more patients to have a regular private family physician.

Keywords: choice, influencing factors, out-of-pocket payments, primary care
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INTRODUCTION

In Singapore, patients are able to choose their preferred primary care provider on a per-episode basis with no restriction by geographical zones. Patients are not required to register a designated care provider, and payment for services is mainly out-of-pocket after each encounter. Despite, or due to the freedom of choice of primary care provider, only 38.4% of residents reported having a regular family doctor in a national survey.[1] This suggests that there is little continuity of care for the majority of residents at the primary care level.

In Singapore, primary healthcare is provided by a mix of 18 government-subsidised outpatient primary care centres (polyclinics) and 2,000 private medical practitioners' clinics.[2] Polyclinics are heavily subsidised one-stop outpatient medical centres with onsite investigative facilities and pharmacy services that provide outpatient medical care for acute and chronic medical conditions as well as routine care such as immunisation and health screening. Subsidy extends from consultations to drugs and investigative tests. Private clinics could be either solo, small group or large healthcare group practices with usually no onsite investigative services and do not receive any government subsidy.

This physical setup of polyclinics with onsite ancillary services, such as laboratory services for blood investigations like full blood count, urea and electrolytes, HbA1c as well as basic imaging such as chest and limb plain films in a pure primary care setting, is perhaps almost unique to Singapore. Internationally, most primary care facilities are usually small standalone practices without any onsite ancillary services, similar to the private sector locally. Patients often need to make several trips to complete additional basic investigations and test results reviewed by the attending family physician.

While services at polyclinics are highly subsidised by the government, mainly through partial financing of the healthcare facility, patient attendances are also high (58 per doctor per day vs. 30 in private clinics),[3] and waiting time for consultation is generally longer.[4] Patients are assigned a doctor from a common pool of medical officers and family physicians at the polyclinic, whereas they are usually attended to by the same family physician at private medical clinics. In 2007, the use of polyclinics was highest among patients aged 60–69 years (41.2%).[1] Among those who sought treatment for chronic diseases such as hypertension and diabetes mellitus, 48.3% and 57.2%, respectively, did so at government polyclinics.[1] This results in a tremendous strain on the limited resources of subsidised facilities at the primary care level.

Given that healthcare is mainly paid in an out-of-pocket manner for the majority of diseases in the primary care setting as well as the fundamentally different infrastructural setup in the

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subsidised facilities, it would therefore be opportune to examine the factors that influence patients' choice of seeking treatment at the polyclinic for their primary care in order to provide pilot data for further research into encouraging utilisation of private primary care facilities. Currently, there is limited knowledge of how the infrastructural setup of primary care clinics could influence patients' choice of primary care physician. Our study thus sought to examine the influence of factors, such as ease of accessibility, cost and on-site investigative services on patients' choice of seeking treatment at polyclinics.

METHODS

We conducted a cross-sectional survey of a convenience sample of 484 random patients who sought treatment at a polyclinic located in a new housing estate from 24 to 27 June 2008. Approval from the Institutional Review Board was obtained for the study. Of the 484 patients who attended the polyclinic, 409 patients who gave consent to be surveyed, completed a self-administered questionnaire on demographic information, mode of transport, expected travel time, reasons for seeking attendance at the polyclinic and factors considered in choosing to seek treatment at the polyclinic.

Respondents were asked about the extent to which they agreed to a series of questions regarding factors such as accessibility, cost and availability of investigative services that they would consider in their choice of a primary care provider. They noted their responses on a Likert scale, ranging from 'strongly disagree' to 'strongly agree'. The questions were as follows: (1) It is convenient to travel to this polyclinic from my last location; (2) This polyclinic has a shorter waiting time compared to a private clinic; (3) I will choose a polyclinic over a private clinic if I think laboratory tests (e.g. blood test) are required; (4) I will choose a polyclinic over a private clinic if I think imaging services (e.g. radiograph) are required; and (5) The lower cost of consultation is the main reason for seeking treatment in a polyclinic. Their responses were re-categorised as 'strongly agree' and 'agree' in one category and 'neutral', 'disagree' and 'strongly disagree' in another category for the purposes of analysis.

Sociodemographic and other characteristics of the respondents were compared among different groups, according to their type of primary care follow-up, with the Kruskal Wallis test for continuous variables and the chi-square test for categorical variables in the univariate analysis. Based on the significant influencing factors in the univariate analysis, a multivariate logistic regression model was built to further understand their relative influence on patients' choice of primary care provider (i.e. a regular at polyclinic or having a regular private general practitioner [GP] or without any regular primary care provider), by adjusting for one another. All tests of significance were two-tailed with a p-value cut-off of 0.05, except for the corrected level of significance, which was set at $p \leq 0.025$ for the multivariate logistic regression model using Bonferroni correction. All tests were performed using the Statistical Package for the Social Sciences version 15.0 (SPSS, Chicago, IL, USA). In addition, the distribution of patients was analysed using the ESRI ArcGIS programme based on their residential postal codes.

RESULTS

A total of 409 out of 484 patients responded to the questionnaire, generating a response rate of 84.5%. 38.1% of respondents were male and 61.9% were female. Female patients were oversampled ($p = 0.001$) as compared to the demographic profile of patients attending the polyclinic between 2006 and 2007, as well as nationally.[5] There were also significantly more patients aged 20–64 years and fewer patients aged < 20 years surveyed in our study (data not shown). The median age of the respondents was 36 years, which was comparable to that of 37.4 years nationally.[5] Singapore citizens constituted 93.4% of respondents and the majority (93.4%) stayed in government-subsidised Housing Development Board (HDB) flats that are built by the Singapore government and priced very competitively. Only 2.4% of the patients stayed in private housing.

About half of the patients (48.1%) were employed, while 22.8% were unemployed, homemakers or retired. Students made up 26.7% of the respondents. 44.2% of patients reported having no income, while only 26.3% reported a monthly income of S$1,500 and above. None had a monthly income ≥S$4,000. There was an over-representation of patients with lower monthly household income as compared to the national statistics (Table I).[6] Overall, 28.1% of respondents were at the polyclinic for treatment of chronic diseases, 66% for acute ailments and 5.9% for routine treatments such as vaccinations. 41.6% of the 363 respondents lived within a straight-line distance of 1 km from the polyclinic (Table I). Only 13.8% of the respondents had a regular GP, while 37.3% were followed up at the polyclinic. 10.8% had both a regular GP and were followed up at the polyclinic. However, 38.1% had no regular primary care doctor (Fig. 1).

Further analyses of the demographic profiles of respondents with a regular GP, those without a regular doctor and those who were followed up at the polyclinic were performed. The 44 patients who reported having follow-up with both a regular GP and at the polyclinic were excluded from the analyses in order not to skew the data toward either group (Table II). Age, employment status and reason for visit were found to be significantly different between respondents with/without a regular GP vs. those who were followed up at the polyclinic. The former were younger than those on follow-up at the polyclinic ($p < 0.001$ by Mann-Whitney U test). Respondents with/without a regular GP were more likely to be employed or students who were seeking treatment for acute conditions. In contrast, those on follow-up with the polyclinic tended to be unemployed, homemakers or retired persons ($p = 0.001$) who were seeking treatment for chronic diseases ($p < 0.001$).

Convenience of travel ($p = 0.002$), availability of laboratory ($p = 0.001$) and imaging ($p = 0.018$) services as well as low consultation cost ($p = 0.024$) were found to be associated

Table I. Profile of all patients in the survey (n = 409).

Characteristic	No. (%)
Gender	
Male	156 (38.1)
Female	253 (61.9)
Residential status	
Singapore citizen	382 (93.4)
Foreigner	7 (1.7)
Permanent resident	20 (4.9)
Age (yrs)	
Mean	36.2
Median	32
House type	
1/2/3/4/5-rm	381 (93.4)
Exec apt/Mansionette	17 (4.2)
Private apt/Condominium	3 (0.7)
Landed property	7 (1.7)
Missing data	1 (0.0)
Employment status	
Employed	187 (48.1)
Unemployed	27 (6.9)
Homemaker	46 (11.8)
Student	104 (26.7)
Retired	16 (4.1)
National service	9 (2.3)
Missing data	20 (4.9)
Income (SGD)	
No income	133 (44.2)
1–499	27 (9.0)
500–999	34 (11.3)
1,000–1,499	28 (9.3)
1,500–1,999	28 (9.3)
2,000–2,999	42 (14.0)
3,000–3,999	9 (3.0)
Missing data	108 (26.4)
Reason for visit	
Acute	270 (66.0)
Chronic	115 (28.1)
Routine	24 (5.9)
Last location	
Home	378 (92.4)
Workplace	20 (4.9)
School	9 (2.2)
Other	2 (0.5)
Mode of transport	
Walking	121 (29.6)
Bus	129 (31.5)
LRT/MRT	96 (23.5)
Taxi	19 (4.6)
Car	44 (10.8)
Distribution of patients (by residence) (n = 363)	
Within 1 km	151 (41.6)
Within 2 km	292 (80.4)
Within 3 km	331 (91.2)

LRT: light rapid transit; MRT: mass rapid transit

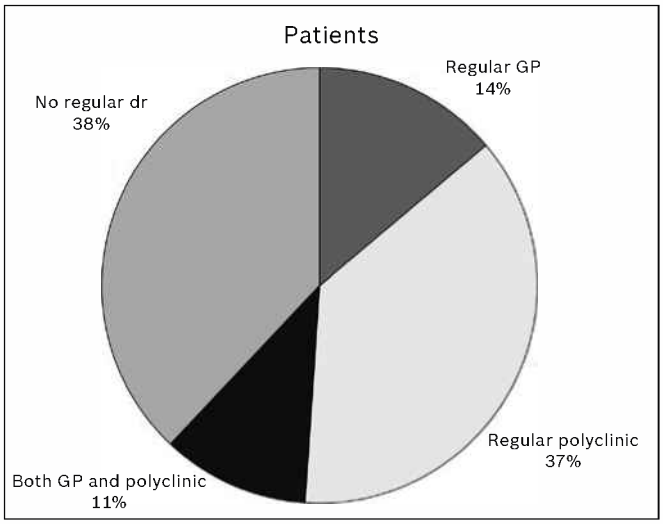

Fig. 1 Pie chart shows the distribution of patients surveyed by type of primary care follow-up.

with attendance at the different regular primary care facilities (Table III). This was despite the perceived longer waiting time at the polyclinic as compared to private GP clinics. Table IV shows the adjusted impact of factors found to be significant in the univariate analysis ($p < 0.05$). After adjusting for convenience of location, availability of laboratory and imaging services, low cost of consultation, employment status and age, reason for visit was the only significant factor associated with seeking treatment at a polyclinic by patients with different regular primary care providers. Respondents with/without a regular GP were more likely to be seeking treatment at the polyclinic for acute conditions or for a routine visit as compared to those on regular polyclinic follow-up (odds ratio [OR] 4.31; $p = 0.012$ and OR 6.39; $p = 0.001$). Respondents who had no regular doctor were more likely to be employed as compared to those on regular follow-up at the polyclinic (OR 2.82, $p = 0.009$).

DISCUSSION

Our study suggests that cost of services, accessibility and the infrastructural setup of a clinic with onsite facilities to perform laboratory tests (such as full blood count, measurement of urea and electrolyte) and the availability of imaging services (such as radiography facilities) are factors that patients consider when seeking treatment at a polyclinic, particularly in a society with a mainly out-of-pocket healthcare financing system. In addition, seeking treatment for chronic diseases appeared to be the overriding reason in multivariate analysis for patients seeking treatment at a heavily subsidised polyclinic. Being employed also appeared to be associated with having no regular doctor.

As Singapore's primary healthcare system allows its residents to select the primary care provider of their choice, residents are not assigned or registered to any single primary care provider. This arrangement, however, militates against continuity of care. A previous surveillance study performed by the Ministry of Health (MOH), Singapore revealed that only 38.4% of the country's residents have a regular family physician.[1] There have been efforts by the government to encourage and enable patients to seek treatment for their ailments at a regular GP largely through addressing the limitations of the out-of-pocket healthcare financing structure in order to decrease the strain on the limited heavily subsidised resources. Low-income elderly and disabled patients have been receiving subsidised healthcare

Table II. Profile of patients surveyed categorised by type of primary care follow-up.

Characteristic	No. (%)		
	Regular GP (n = 56)	Regular polyclinic (n = 152)	No regular doctor (n = 155)
Gender			
Male	23 (41.1)	50 (32.9)	68 (43.87)
Female	33 (58.9)	102 (67.1)	87 (56.13)
Residential Status			
Singapore citizen	54 (96.4)	143 (94.1)	140 (90.32)
Foreigner	1 (1.8)	1 (0.7)	5 (3.23)
Permanent resident	1 (1.8)	8 (5.3)	10 (6.45)
Age (yrs)*			
Mean ± SD	27 ± 17.4	44.1 ± 23.6	29.9 ± 15.2
Median	21.5	50	26
House Type			
HDB 1/2/3/4/5-rm	49 (87.5)	142 (94.0)	147 (94.84)
Exec apt/mansionette	3 (5.4)	7 (4.6)	6 (3.87)
Private apt/condominium	-	2 (1.3)	-
Landed property	4 (7.1)	-	2 (1.29)
Employment status†			
Employed	26 (49.1)	59 (41.8)	83 (54.97)
Unemployed	2 (3.8)	16 (11.3)	4 (2.65)
Homemaker	3 (5.7)	28 (19.9)	8 (5.30)
Student	19 (35.8)	24 (17.0)	52 (34.44)
Retired	-	11 (7.8)	2 (1.32)
National serviceman	3 (5.7)	3 (2.1)	2 (1.32)
Income (SGD)			
No income	18 (43.9)	57 (52.3)	41 (36.61)
1–499	4 (9.8)	9 (8.3)	10 (8.93)
500–999	3 (7.3)	10 (9.2)	17 (15.18)
1,000–1,499	5 (12.2)	9 (8.3)	11 (9.82)
1,500–1,999	4 (9.8)	12 (11.0)	9 (8.04)
2,000–2,999	6 (14.6)	9 (8.3)	19 (16.96)
3,000–3,999	1 (2.4)	3 (2.8)	5 (4.46)
Missing data	15	43	43
Reason for visit‡			
Acute	44 (78.6)	68 (44.8)	134 (86.5)
Chronic	7 (12.5)	74 (48.7)	14 (9.0)
Routine	5 (8.9)	10 (6.6)	7 (4.5)

* When compared against patients with regular follow-up at the polyclinic, both patients with a regular GP and those without were significantly younger ($p < 0.001$) by Mann-Whitney U test.
† When compared against patients with regular follow-up at the polyclinic, both patients with a regular GP and those without had significantly lower proportion of persons without employment (includes the unemployed, homemakers, retired and national servicemen [$p = 0.001$]) by chi-square test.
‡ When compared against patients with regular follow-up at the polyclinic, both patients with a regular GP and those without had significantly higher proportion of acute patients ($p < 0.001$) by chi-square test.

at participating private clinics since 2000.[7,8] The utilisation of personal mandatory health savings account (Medisave) for treatment of approved chronic diseases in the primary care setting, within an annual withdrawal limit, was also made possible in October 2006.[9]

In our study, 37.3% of the respondents reported regular follow-up with the polyclinic, while another 38% did not have any regular doctor. Interestingly, despite the sampling from the polyclinic, 13.8% of respondents reported having a regular GP. Patients with/without a regular GP were younger and were either employed or students. They were also more likely to seek episodic treatment for acute ailments, which would have less financial implications. It is possible that these patients' treatment at a private GP would be mostly borne by the employer through medical benefits. Students were likely to seek treatment at the primary care provider of their parents' choice. We found that patients on follow-up at the polyclinic were mostly the elderly, the unemployed, retirees or homemakers who were seeking treatment for chronic diseases. This is not unexpected, as the polyclinic system has been established by the Singapore government to provide affordable, heavily subsidised primary healthcare to the lower-income group. However, we found that patients chose to be followed-up at polyclinics despite the perceived longer waiting times and the availability of financing schemes to subsidise private primary care treatment.

In the UK, patients with long-standing illness value seeing their own GP more than having a shorter waiting time for an appointment (≥ 7-fold), and would wait even an extra one day for an appointment with the GP of their choice.[10] It would be reasonable to expect that local patients with chronic diseases would value continuity of care with a regular doctor to a similar extent. However, in our study, patients with regular follow-up at the polyclinic were more likely to seek treatment at the polyclinic for chronic diseases as compared with those who reported having

Table III. Factors considered by patients attending different types of regular primary care facilities when seeking treatment at the polyclinic.

Factor	No. (%)				*p-value
	Regular GP (n = 56)	Regular polyclinic (n = 152)	No regular doctor (n = 155)	Total (n = 409)	
It is convenient to travel to this polyclinic from my last location.					
Strongly agree/agree	39 (78.0)	142 (94.7)	131 (85.6)	353 (89.1)	0.002
Strongly disagree/disagree/neutral	11 (22.0)	8 (5.3)	22 (14.4)	43 (10.1)	
Missing data	6 (10.7)	2 (1.3)	2 (1.3)	13 (3.2)	
This polyclinic has a shorter waiting time compared to a private clinic.					
Strongly agree/agree	7 (14.3)	25 (16.9)	25 (16.8)	61 (15.7)	0.905
Strongly disagree/disagree/neutral	42 (85.7)	123 (83.1)	124 (83.2)	328 (84.3)	
Missing data	7 (12.5)	4 (2.6)	6 (3.9)	20 (4.9)	
I will choose a polyclinic over a private clinic if I think laboratory tests (e.g. blood test) are required.					
Strongly agree/agree	39 (78.0)	133 (90.5)	113 (73.9)	324 (82.4)	0.001
Strongly disagree/disagree/neutral	11 (22.0)	14 (9.5)	40 (26.1)	69 (17.6)	
Missing data	6 (10.7)	5 (3.3)	2 (1.3)	16 (3.9)	
I will choose a polyclinic over a private clinic if I think imaging services (e.g. X-ray) are required.					
Strongly agree/agree	40 (78.4)	134 (88.2)	116 (75.8)	331 (87.0)	0.018
Strongly disagree/disagree/neutral	11 (21.6)	18 (11.8)	37 (24.2)	68 (17.0)	
Missing data	5 (8.9)	-	2 (1.3)	10 (2.4)	
The lower cost of consultation is the main reason for seeking treatment at a polyclinic.					
Strongly agree/agree	43 (82.7)	139 (93.3)	126 (84.0)	346 (88.0)	0.024
Strongly disagree/disagree/neutral	9 (17.3)	10 (6.7)	24 (16.0)	47 (12.0)	
Missing data	4 (7.1)	3 (2.0)	5 (3.2)	16 (3.9)	

* Chi-square test among patients with a regular GP, those with regular follow-up at polyclinic and those without a regular doctor.

a regular GP. This was despite not being always assured of seeing a regular doctor at the polyclinic. Patients could have perceived continuity of care as having all their medical records at the same facility instead of having a regular attending doctor, and were hence satisfied with the level of care provided.

A US national survey revealed that only 28.5% of respondents cited cost as a major factor when considering a primary care provider. Convenience and perceived quality were the major factors considered by 67.2% and 65.7% of the respondents, respectively.[11] In a survey on public perceptions of healthcare in Singapore, the level of confidence in the quality of healthcare provision by the subsidised and private sectors was fairly similar.[12] Therefore, perceived differences in quality do not appear to deter Singaporeans from seeking treatment from either sector.

Our study suggests that convenience of travel is a factor considered by patients in seeking treatment at the polyclinic. Other studies have shown that geographic and spatial factors, such as transportation and distance for regular care, were significantly associated with higher healthcare utilisation for regular check-ups and chronic care for patients in a rural area.[13] The polyclinic is highly accessible to the population that it is serving. The majority of patients in our study resided within 2 km of the facility, and about 60% travelled to the facility either on foot or by bus.

More interestingly, the availability of onsite ancillary services such as laboratory and imaging services also appeared to influence the patients' choice of seeking treatment at the polyclinic if they perceived further investigations to be required for their condition. This could be due to the convenience of onsite ancillary facilities, although we were unable to exclude the low cost of these subsidised services as the reason for the patients' responses. Further research could be conducted to evaluate if patients' preference for seeking treatment at a primary care provider with onsite ancillary facilities is independent of cost. This could then inform policy makers on how best to redesign the delivery of private primary healthcare to encourage patients, particularly those with chronic disease and who can afford private services, to seek treatment with a regular GP so as to improve continuity of care.

The importance of 'good value for money' over location, derived from research on understanding factors influencing consumers' choice of a store,[14] could be extrapolated to aid in understanding the factors that influence patients' choice of a primary care provider. Value for money is based not only on the minimum purchase price (economy), but also on the maximum efficiency and effectiveness of the purchase.[15] Therefore, whether onsite ancillary services such as basic laboratory tests (e.g. full blood count, urea and electrolyte levels and HbA1c) and imaging facilities (e.g. plain films, ultrasonography), which could potentially save patients' time from having to make additional trips to off-site facilities for investigations, would render a facility 'good value for money' if low cost is not a confounding factor, is yet to be ascertained. However, our study suggests that patients appear

Table IV. Multivariate analysis of factors influencing patients' choice of seeking treatment at a polyclinic.

Influencing factor	Regular GP vs. regular polyclinic		No regular doctor vs. regular polyclinic	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Reason for visit				
Acute or routine visit	4.31* (1.374–13.503)	0.012	6.39* (2.925–13.938)	< 0.001
Chronic†	-	-	-	-
Convenience of location				
Strongly agree/agree	0.39 (0.126–1.189)	0.097	0.53 (0.200–1.384)	0.193
Strongly disagree/disagree/neutral†	-	-	-	-
Availability of laboratory services				
Strongly agree/agree	0.55 (0.131–2.331)	0.419	0.39 (0.126–1.202)	0.101
Strongly disagree/disagree/neutral†	-	-	-	-
Availability of imaging services				
Strongly agree/agree	1.27 (0.313–5.131)	0.739	1.41 (0.472–4.183)	0.542
Strongly disagree/disagree/neutral†	-	-	-	-
Lower cost of consultation				
Strongly agree/agree	0.55 (0.188–1.631)	0.283	0.72 (0.291–1.779)	0.475
Strongly disagree/disagree/neutral†	-	-	-	-
Employment status				
Employed	1.91 (0.663–5.525)	0.230	2.82* (1.288–6.152)	0.009
Student	1.41 (0.397–5.020)	0.594	2.13	0.142
Unemployed†	-	-	-	-
Age (per five years older)	0.87 (0.765–0.999)	0.049	0.93 (0.844–1.030)	0.167

*Denotes statistical significance at the corrected level of significance p ≤ 0.025 for multiple comparisons (using Bonferroni correction)
†Reference category for each categorical factor

to be willing to trade off a longer waiting time for availability of onsite ancillary services if the investigations are perceived to be required for their medical condition, even among those with a regular GP.

Our study was limited by the fact that it was a convenience sample of patients taken from a polyclinic; therefore, there may be a preponderance for orientation to polyclinic services regardless of the type of regular primary care provider. The sampled population was also younger than the patient population that sought treatment at the polyclinic. However, this may not have influenced the results significantly, as the main determinant identified in influencing one's choice of seeking treatment at the polyclinic was treatment for chronic disease, and younger patients are less likely to have underlying chronic diseases. At the same time, the sampled population of younger patients who sought treatment at the polyclinic provided insights on the factors influencing their choice of seeking treatment at the polyclinic.

In conclusion, in a healthcare system where services are mainly paid for out-of-the-pocket and patients are free to choose their primary care provider, it is important to explore the factors that influence their choice of seeking treatment at the polyclinic, a very limited resource as compared to the private primary care sector. This study suggests that further research could be conducted into understanding whether factors such as onsite ancillary facilities would influence patients, particularly those with chronic diseases, to seek treatment at private GP clinics instead of the polyclinic. Such information would be useful in redesigning private primary care infrastructure to encourage patients with chronic diseases to seek treatment at a regular private primary care provider.

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REFERENCES

1. Ministry of Health, Singapore. National Health Surveillance Survey 2007, 64-67. In: Ministry of Health, Singapore [online]. Available at: www.moh.gov.sg/content/moh_web/home/Publications/Reports/2009/national_health_surveillancesurvey2007.html. Accessed January 29, 2012.
2. Healthcare Facilities. In: Ministry of Health, Singapore [online]. Available at: www.moh.gov.sg/content/moh_web/home/our_healthcare_system/Healthcare_Services/Primary_Care.html. Accessed January 29, 2012.
3. Primary Care Survey 2005. In: Ministry of Health, Singapore [online]. Available at: www.moh.gov.sg/content/moh_web/home/Publications/Reports/2006/primary_care_survey2005.html. Accessed January 29, 2012.
4. Statistics. In: Ministry of Health, Singapore [online]. Available at: www.moh.gov.sg/content/moh_web/home/statistics/healthcare_institutionstatistics/Waiting_Times_for_Registration_and_Consultation_at_Polyclinics.html. Accessed January 29, 2012.
5. Census of population 2010. Advance Census Release. In: Singapore Department of Statistics [online]. Available at: www.singstat.gov.sg/pubn/popn/c2010acr.pdf. Accessed April 12, 2011.
6. Census of population 2010. Statistical Release 2. Households and Housing. In: Singapore Department of Statistics [online]. Available at: www.singstat.gov.sg/pubn/popn/c2010sr2/cop2010sr2.pdf. Accessed April 12, 2011.
7. Ministry of Health, Singapore. Bringing Affordable Healthcare Closer To Needy Elderly Factsheet. Available at: www.moh.gov.sg/mohcorp/publicationsinfopapers.aspx?id=15982. Accessed January 20, 2010.
8. Ministry of Health, Singapore. Community Health Assist Scheme. Available at: www.moh.gov.sg/content/moh_web/home/costs_and_financing/schemes_subsidies/Community_Health_Assist_Scheme.html. Accessed January 29, 2012.

9. Ministry of Health, Singapore. Healthcare Financing. Available at: www.moh.gov.sg/content/moh_web/home/costs_and_financing/schemes_subsidies/medisave/Chronic_Diseases.html. Accessed January 29, 2012.
10. Rubin G, Bate A, George A, Shackley P, Hall N. Preferences for access to the GP: a discrete choice experiment. Br J Gen Pract 2006; 56:743-8.
11. Tu HT, Lauer JR. Word of mouth and physician referrals still drive health care provider choice. Center for Studying Health System Change Research Brief 2008; 9.
12. Lim JF, Joshi VD. Public perceptions of healthcare in Singapore. Ann Acad Med Singapore 2008; 37:91-5.
13. Arcury TA, Gesler WM , Preisser JS, et al. The effects of geography and spatial behaviour on health care utilization among residents of a rural region. Health Serv Res 2005; 40:135-55.
14. Grocery Store Choice & Value for Money. A Globel Nielsen Consumer Report. January 2008. Available at: http://nz.nielsen.com/reports/index.shtml. Accessed January 29, 2012.
15. Value for money (VFM). In: BusinessDictionary.com [online]. Available at: www.businessdictionary.com/definition/value-for-money-VFM.html. Accessed April 14, 2011.