ORIGINAL ARTICLE

The development of a Health Call Centre in Hong Kong: a study on the perceived needs of patients

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Objectives To assess the preference for the development of a Health Call Centre and the perceived needs of patients in Hong Kong.

Design Cross-sectional, questionnaire-based survey.

Setting Two general out-patient clinics from health facilities in a geographical region in Hong Kong.

Participants Patients aged 18 years or above were recruited for the study, which was conducted between January and March 2009.

Main outcome measures Patients' perspectives of a Health Call Centre, perceived needs for services, perceived health status, and socio-demographic status.

Results A total of 403 participants completed the questionnaire with a response rate of 78%. A total of 342 (85%) supported the development of a Health Call Centre. Providing basic health and chronic disease information, current health conditions and treatment information, and caregiver support advice were cited as the top perceived needs on the development of a Health Call Centre. Adjusting for age, education, and individual monthly income, participants aged 31 to 64 years (odds ratio=4.37; 95% confidence interval, 1.92-9.99; P<0.001) and caregivers (odds ratio=3.41; 95% confidence interval, 1.21-9.59; P=0.020) were more likely to use the Health Call Centre. Presence of chronic illness had no significant correlation with the use of a Health Call Centre (odds ratio=1.43; 95% confidence interval, 0.69-3.00; P=0.340).

Conclusions This is the first study to assess the preferences for the development of a Health Call Centre and the perceived needs of patients in Hong Kong. The majority supported the development of a Health Call Centre. Services provided could meet the general needs of all patients and caregivers, and be accessible to old people.

Key words
Health services accessibility; Practice management

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Introduction

It is suggested that health care systems should adopt a shared vision of six specific aims for improvement.[1] Thus, they need to be safe, effective, patient-centred, timely, efficient, and equitable. Timely provision of health care of reasonable quality is therefore one of the great challenges in many countries. With the growing demand for health services as a result of ageing populations and advances in medical technology, the response of the traditional model of health service delivery can no longer meet these needs. Good access to health information can empower patients to make informed decisions about their own health care. The United States was the first country to use telephone triage and advice services extensively in primary care.[2] These services were usually nurse-led, offered by health care facilities, such as Health Maintenance Organizations, and operated after office hours. The triage nurses answer calls from patients who have specific or health care needs and assess the severity of their conditions. Medical advice and recommendations for care are provided, including directing patients to emergency services, making medical appointments, and providing self-care instructions and health information.[3] Other countries, such as the United Kingdom and Australia, developed health call centres which provide an alternative health service to patients, including telephone consultation and patient and caregiver support. In the United Kingdom, a nurse-led, nation-wide, 24-hour telephone hotline

service called the *NHS Direct* gives advice to callers using a computerised decision support system.[4,5] It provides rapid advice and information on health matters and/or the availability of health services.[4,5] In Australia, *HealthDirect* provides similar services to *NHS Direct*. It is a telecommunicating system providing advice to the community in response to an individual's urgent need for health information.[6] It also provides disease and health management information, treatment advice and counselling, assessment and triage of medical problems, and refers patients to appropriate health providers.[7]

The Hong Kong health care system is a dual system. It has a public sector and a private sector. Most out-patient and primary care is largely provided by the private sector, and the bulk of specialist and in-patient secondary and tertiary care is delivered through the public sector. All Hong Kong residents are eligible to receive care from the public sector at a heavily subsidised rate. The Hospital Authority, which is the biggest public service provider, is therefore facing problems due to escalating health care cost. With reference to the document presented to the Hong Kong Legislative Council by the Hospital Authority, in 2007 the 99th percentile of waiting time for consultations with departments of Medicine and Surgery were 92 and 206 weeks, respectively.[8] With the ageing population, advances in medical technology and the global economic crisis in the context of the low tax system from which government general revenues are derived; the financial sustainability of the public health sector has been questioned. Moreover, the huge workload in the public sector makes it increasingly difficult to provide high-quality health services.

There is increasing evidence showing that setting up a call centre can improve the quality of care and may eventually reduce health care costs. Call centres have been shown to help take the pressure off general practitioners and accident and emergency departments (A&E). A study found that nearly three-quarters of callers would have either had gone to their general practitioners or attended A&E if they had not been able to phone *NHS Direct*.[9] In addition, less than two-thirds of the callers attended A&E with the same presenting complaint subsequently.[10] Other telephone consultations also reduced home visits and surgery attendances out of hours as well as the overall workload of general practitioners.[11] In addition, call centres also have the potential to empower patients and facilitate self-care. Declines in days in hospitals, and the number of out-patient visits and hospitalisation have been observed in patients who manage their own health.[12] The *NHS Direct* facilitates patient empowerment by enabling patient self-care and accessing health advice and services. Patients can be empowered by legitimising help-seeking actions and reducing 'un-necessary' demand.[13] Most importantly, the majority of callers have been satisfied with the services they received and followed the advice given.[4]

The Hospital Authority intends to develop a Health Call Centre, and the ultimate model would be similar to that of the *NHS Direct* in the United Kingdom and the *HealthDirect* in Australia. However, the perspectives of the patients on a Health Call Centre have not been investigated. A questionnaire-based survey of patients recruited at two general out-patient clinics (GOPCs) was therefore conducted. The objectives of this study were to assess the preferences for the development of a Health Call Centre and the perceived needs of patients in Hong Kong.

在香港發展健康電話支援服務：病人對服務需求的研究

目的 探討在香港發展健康電話支援服務的意願以及病人對此服務的需求。

設計 以問卷形式進行的橫斷面研究。

安排 於香港其中一個區域的兩間普通科診所。

參與者 2009年1月至3月期間到上述診所求診的18歲或以上的病人。

主要結果測量 病人對於健康電話支援服務服務的觀點、對此服務的需求、對自己健康狀況的評估及其一般人口學資料。

結果 共403人完成問卷，總回應率為78%。342人（85%）支持發展健康電話支援服務，其中最多人認為有此需要的原因是此服務能提供基本的健康及慢性疾病的資料、為病人解答關於他們健康狀況及提供治療方法、以及為照顧者提供支援服務。調整參與者的年齡、教育背景及月薪後，發現年齡為31至64歲（比數比=4.37；95%置信區間：1.92-9.99；P<0.001）及作為照顧者身份（比數比=3.41；95%置信區間1.21-9.59；P=0.020）的被訪者有較大機會使用健康電話支援服務。而慢性疾病對於會否使用健康電話支援服務並無顯著關係（比數比=1.43；95%置信區間：0.69-3.00；P=0.340）。

結論 這是第一個在香港發表對於發展健康電話支援服務的意願以及病人對服務需求的研究。大部份被訪者都支持發展此服務。健康電話支援服務須滿足病人及照顧者的一般需求，並使長者能容易獲得有關服務。

Methods

Setting and participants

The main study was conducted between January and March 2009, and took the form of a cross-sectional, questionnaire-based survey. A multi-stage sampling method was used to recruit patients. Two GOPCs, from a geographical region of health facilities of the Hospital

Authority, were randomly selected. Commercial software was used to generate randomised numbers which were used to select consultation rooms in these two clinics. Patients aged 18 years or more who attended the selected consultation rooms were approached by trained interviewers. Those under 18 years of age, having dementia, or unable to give informed consent, communicate effectively or understand Cantonese, Mandarin, or English were excluded. Before implementing the main study, pilot testing of the questionnaire and the interview procedures on 25 GOPC patients (15 men and 10 women) was carried out.

Oral consent was obtained before initiating the interview. This study was approved by the Hospital Authority cluster clinical research ethics committee and was performed in accordance with the World Medical Association's Declaration of Helsinki.

Interview methods

Patients from the selected consultation rooms were approached by trained interviewers while they were waiting for their consultation in the waiting area. Participants were required to complete a self-administered questionnaire. Those who were unable to read or write had the questionnaire completed with the assistance of trained interviewers.

Measuring instrument

A structured questionnaire was developed based on literature review and expert opinions. It was a 25-item questionnaire designed to measure (1) perspectives of the Health Call Centre (preference of establishment of the Call Centre, services provided, and operation); (2) needs for services (choice of health professional or self-management, use of health hotline before and reasons of supporting or rejecting a health hotline); (3) perceived health status (self-reported chronic illness and health conditions, being cared/caregiver, smoking and drinking habits, eligibility for fee waiver and insurance coverage); and (4) socio-demographic characteristics (age, gender, marital status, education level, working status, individual monthly income and district of residence). The questionnaire was pilot-tested and adjustments were made before implementing the main study.

Statistical analysis

Participant responses to the questionnaire were analysed using descriptive statistics. The Chi squared test was used to assess the association between preferences of developing a Health Call Centre and independent variables included presence of chronic illness, taking care of other sick people, being cared for by other people, private health insurance coverage, types of fee waiver, and socio-demographic status. Multiple logistic regression controlling for age, education, and individual monthly income was used to identify potential determinants of the preference for developing a Health Call Centre.

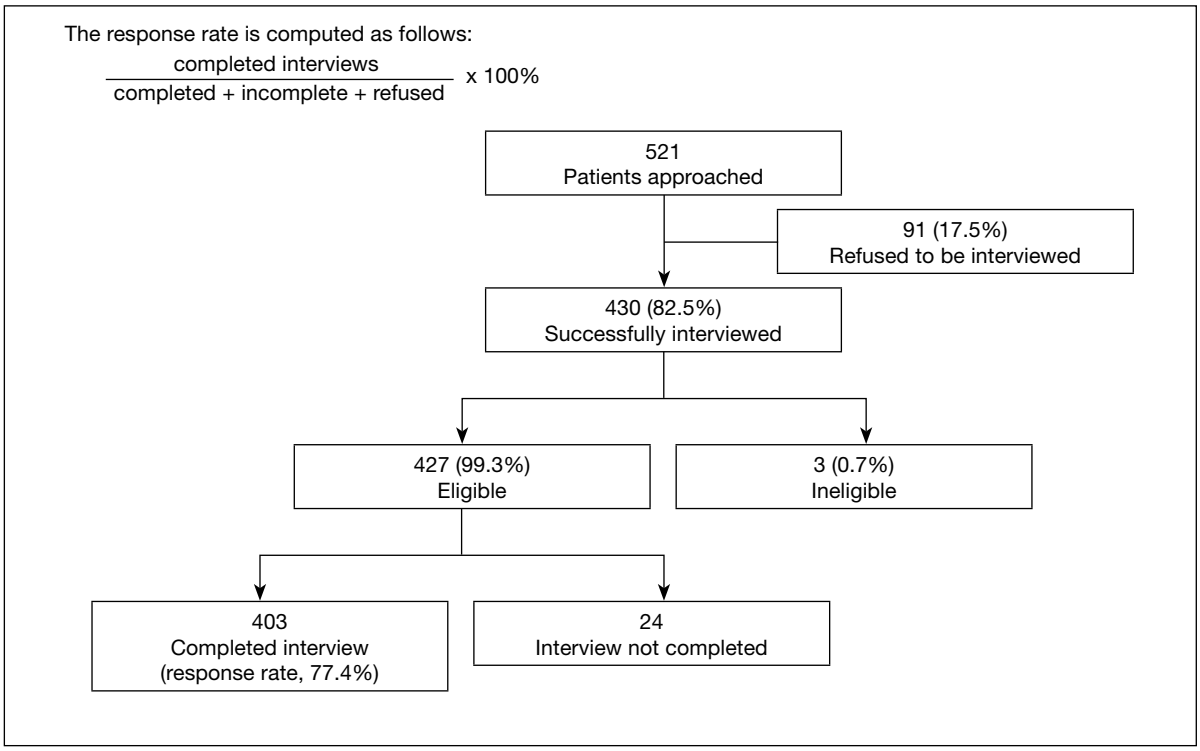

FIG. Flowchart of major outcomes of patient recruitment

Results

A total of 521 patients were approached; 430 (82.5%) patients were interviewed successfully whereas 91 (17.5%) refused. Regarding those agreed to be interviewed, 24 (5.6%) patients did not complete the questionnaire and three (0.7%) of the questionnaires were ineligible. Four hundred and three patients completed the questionnaire successfully with an overall response rate of 77.4% (Fig).

In all, 203 (50.5%) participants were women, about three quarters (73.8%) were aged between 31 and 64 years, and 132 (32.8%) had had no schooling or had completed only primary education. Three hundred and thirty-one (82.1%) of them were married, 118 (29.4%) were retired, and 164 (42.4%) received no individual monthly income. Two hundred and ninety-two (73.2%) and 278 participants (69.3%) had no fee waiver and no insurance cover, respectively. For self-reported health status, 169 (42.0%) had hypertension, 62 (15.4%) had diabetes and 43 (10.7%) had a lipid disorder, while 161 (40.0%) reported no chronic illness (Table 1).

A total of 390 (97.5%) participants had never used a health hotline before but 342 (84.9%) agreed that the Hospital Authority should develop a Health Call Centre. Regarding the functions of the Health Call Centre, basic health and chronic disease information (94.2%), current health conditions and treatment information (57.0%), and caregiver support advice (53.2%) were cited as the top three priorities. The majority preferred to have calls answered by staff directly (91.8%). They preferred to have doctors (65.0%), nurses (53.3%) and/or trained volunteers (30.7%) to answer the calls. The services of the Health Call Centre should be provided free of charge (83.9%) and there was a preference that it should operate 24 hours a day (61.0%) and on 7 days a week (66.3%) [Table 2].

A Chi squared analysis was performed and showed that the presence of self-reported chronic illness was significantly correlated with the age of the participants (X^2=61.95, P<0.001). Approximately 89% of the participants aged 65 years or older had at least one self-reported chronic disease compared with 58% of those aged 31-64 years and 4% for those aged 18-30 years.

Factors affecting the preference for developing a Health Call Centre were first explored using univariate analysis (Table 3). Chi squared tests were performed to identify potential factors which might affect the preference. Socio-demographic variables (age, education, working status, and individual monthly income), taking care of and being cared for by other people, health insurance cover and types of fee waiver were significantly correlated with the preference of developing a Health Call Centre. In the logistic regression model, after controlling for age, education and individual monthly income, participants aged

TABLE 1. Demographic characteristics and related health information of respondents (n=403)

Characteristic	% (No.) of respondents
Gender	
Male	49.5 (199)
Female	50.5 (203)
Missing data	(1)
Age (years)	
18-30	6.5 (26)
31-64	73.8 (295)
≥65	19.8 (79)
Missing data	(3)
Education	
Primary school or below	32.8 (132)
Secondary school	53.5 (215)
University or above	13.7 (55)
Missing data	(1)
Marital status	
Single	10.4 (42)
Married	82.1 (331)
Widowed	3.2 (13)
Divorced/separated	4.2 (17)
Working status	
Employed (self, full-time, and part-time)	45.9 (184)
Unemployed	6.7 (27)
Retired	29.4 (118)
Housework	16.2 (65)
Student	1.7 (7)
Missing data	(2)
Individual monthly income (HK$)	
$0	42.4 (164)
$1- $4999	11.4 (44)
$5000 - $14 999	29.5 (114)
$15 000 - $30 000	14.0 (54)
>$30 000	2.8 (11)
Missing data	(16)
Health insurance coverage	
None	69.3 (278)
Yes	30.7 (123)
Missing data	(2)
Chronic disease status (can choose more than one answer)	
Hypertension	42.0 (169)
Diabetes mellitus	15.4 (62)
Hyperlipidaemia	10.7 (43)
Heart disease	5.7 (23)
Lung disease	0.5 (2)
Cancer	1.5 (6)
Others	12.4 (50)
None	40.0 (161)
Missing data	(1)

TABLE 2. Respondents' perspectives on a Health Call Centre

Question and response	% (No.) of respondents
Used any health hotline before? (n=403)	
No	97.5 (390)
Yes	2.5 (10)
Missing	(3)
Should develop a chronic health call centre? (n=403)	
No	14.9 (60)
Yes	84.9 (342)
No comment	0.2 (1)
Services provided in chronic health call centre (n=342)*	
Basic health and chronic disease information	94.2 (322)
Explain current health conditions and treatment	57.0 (195)
Provide caregiver support	53.2 (182)
Assist in decision making on further treatment	44.4 (152)
Provide instructions on handling minor health problems	43.6 (149)
Assist in decision making on emergency services	24.9 (85)
Others	1.5 (5)
Operation of chronic health call centre preferred (n=342)*	
Call answered by staff	91.8 (314)
Automated service	15.5 (53)
Voice mail and call back service	17.3 (59)
Who should answer the call? (n=314)*	
Doctors	65.0 (199)
Nurses	53.3 (163)
Pharmacists	21.9 (67)
Social workers	14.1 (43)
Trained volunteers	30.7 (94)
Others	4.9 (15)
Missing	(8)
Fee for call (n=342)	
No	83.9 (286)
Yes	16.1 (55)
Missing	(1)
Call centre operation time preferred (n=342)	
24 hours	61.0 (203)
9am – 6pm	36.0 (120)
Others	3.0 (10)
Missing	(9)
7 days a week	66.3 (222)
Mon – Fri	31.6 (106)
Others	2.1 (7)
Missing	(7)

* Can choose more than one answer

31 to 64 years (odds ratio=4.37; 95% confidence interval, 1.92-9.99; P<0.001) and caregivers (3.41; 1.21-9.59; P=0.020) were more likely to be potential users of the Health Call Centre, while the presence of self-reported chronic disease had no significant correlation with the likelihood of using it (1.43; 0.69-3.00; P=0.340) [Table 4].

Discussion

This is the first study conducted on the perceived needs of Hong Kong patients on the development of a Health Call Centre. According to Bradshaw taxonomy of the social needs, felt needs or perceived needs are equated with wants and are limited by the perception of the individuals with regard to the health services available.[14] Needs assessment is important in health service planning, because it helps policy-makers to better coordinate the resource, and meets patient expectations.[15]

Overseas experience shows that the establishment of the Health Call Centre not only has the potential of cutting waiting times, but also improves clinical outcomes and facilitates patient empowerment.[3-5,9,11,13] Its development can change the service provision; it allows patients to take an active part in the management of their chronic conditions, provides guidance, and assists them and their caregivers to self-manage their health conditions. These benefits may lower the number of out-patient visits, hospitalisations, and days in hospitals. Our study facilitates understanding of the perceived needs of patients in order to design an appropriate Health Call Centre.

We found that approximately 85% of participants agreed with developing a Health Call Centre. This might reflect the lack of supportive health care service in the community. A World Health Organization report emphasises the importance of primary care in disease management.[16] Poor disease management may lead to higher rates of hospital readmissions. Social factors—which include coping, carer systems, and community services—are factors likely to influence readmissions.[17] In Hong Kong, however, the collaboration between in-hospital and community services is minimal. A focus group study revealed that many patients in Hong Kong did not receive community support services such as telephone follow-up and post-discharge home visits.[18] They were also unfamiliar and had limited information on the scope and role of community support services, which could affect their health management.

Participants of this study stated that basic health and disease information, current health conditions and treatment information, and caregiver support advice were the most needed services of a Health Call Centre. These results were comparable to those of other studies and the current services provided

TABLE 3. Univariate analysis of potential factors affecting preferences for developing a Health Call Centre

Characteristic	Chi squared test			
	Agree to develop a Call Centre % (No.)	Disagree to develop a Call Centre % (No.)	X^2	P value
Gender				
Male	49.3 (168)	51.7 (31)	0.118	0.780
Female	50.7 (173)	48.3 (29)		
Age (years)				
18-30	6.8 (23)	3.3 (2)	36.269	<0.001
31-64	78.5 (266)	48.3 (29)		
≥65	14.7 (50)	48.3 (29)		
Education				
Primary school or below	28.1 (96)	61.0 (36)	25.784	<0.001
Secondary school	58.2 (199)	27.1 (16)		
University or above	13.7 (47)	11.9 (7)		
Marital status				
Married	82.5 (282)	81.7 (49)	0.022	0.856
Others	17.5 (60)	18.3 (11)		
Working status*				
Working	48.2 (164)	31.7 (19)	5.641	0.024
Not working	51.8 (176)	68.3 (41)		
Individual monthly income				
No income ($0)	38.9 (128)	63.2 (36)	11.694	0.001
Received income	61.1 (201)	36.8 (21)		
Health status				
No difference – much better	68.0 (230)	56.9 (33)	2.760	0.100
Worse – much worse	32.0 (108)	43.1 (25)		
Being cared for by other people				
Yes	9.6 (33)	20.0 (12)	5.501	0.026
No	90.4 (309)	80.0 (48)		
Caregiver				
Yes	19.7 (67)	8.5 (5)	4.288	0.043
No	80.3 (273)	91.5 (54)		
Health insurance coverage				
Yes	32.9 (112)	18.3 (11)	5.111	0.023
None	67.1 (228)	81.7 (49)		
Fee waiver				
Yes	27.5 (94)	28.3 (17)	0.018	0.877
None	72.5 (248)	71.7 (43)		
Types of fee waiver†				
CSSA/disability allowance	26.7 (24)	56.3 (9)	5.545	0.037
Civil servant/HA benefits	73.3 (66)	43.8 (7)		
Presence of chronic disease				
Yes	41.3 (141)	31.7 (19)	1.995	0.198
None	58.7 (200)	68.3 (41)		
Treatment on health problem last time				
Yes	2.9 (10)	6.7 (4)	2.127	0.141
No treatment	97.1 (332)	93.3 (56)		
Methods of solving health problem last time				
Ask health professional/others	80.1 (274)	83.3 (50)	0.781	0.677
Self (internet/books/others)	7.6 (26)	8.3 (5)		
Both	12.3 (42)	8.3 (5)		
Used health hotline before				
Yes	2.7 (9)	1.7 (1)	0.204	1.000
No	97.3 (330)	98.3 (59)		

* Working: self-employed, working full time or part time
Not working: retired, unemployed, student, housework

† CSSA denotes Comprehensive Social Security Assistance, and HA Hospital Authority

TABLE 4. Multivariate analysis of potential factors affecting preferences for developing a Health Call Centre

Factor	Logistic regression	
	Odds ratio (95% confidence interval)	P value
Age (years)		
18-30	5.25 (0.93-29.56)	0.060
31-64	4.37 (1.92-9.99)	<0.001
≥65	1.0 (reference)	
Income		
No income	0.30 (0.06-1.38)	0.120
Received income	1.0 (reference)	
Education		
Primary school or below	0.55 (0.19-1.60)	0.260
Secondary school	1.60 (0.58-4.43)	0.363
University or above	1.00 (reference)	
Working status*		
Working	0.25 (0.05-1.19)	0.080
Not working	1.00 (reference)	
Being cared for by other people		
Yes	0.56 (0.23-1.35)	0.195
No	1.00 (reference)	
Caregiver		
Yes	3.41 (1.21-9.59)	0.020
No	1.00 (reference)	
Health insurance coverage		
Yes	1.04 (0.46-2.35)	0.922
None	1.00 (reference)	
Types of fee waiver†		
CSSA/disability allowance	0.54 (0.21-1.43)	0.214
Civil servant/HA benefits	1.09 (0.42-2.83)	0.865
None	1.00 (reference)	
Presence of self-reported chronic illness		
None	1.43 (0.69-3.00)	0.340
Yes	1.00 (reference)	

* Working: self-employed, working full time or part time
Not working: retired, unemployed, student, housework

† CSSA denotes Comprehensive Social Security Assistance, and HA Hospital Authority

in western countries. The majority of *NHS Direct* callers seek advice on the immediate management of mainly minor illnesses and injuries[19] and the telephone triage services in the United States assess patients' current health conditions and give health care recommendations.[3] A study in Australia also showed that caregivers would like to receive more advice on rehabilitation and symptoms to be aware of, all of which indicate that support services to caregivers are important.[20]

Evidently older people were less likely to use the Health Call Centre, which was similar to the findings pertaining to *NHS Direct*. It has been reported that the awareness of *NHS Direct* declined with advanced age.[21] Older people may have impaired hearing problems, difficulties in accessing and using a telephone system.[22] A study assessing the use of *NHS Direct* also reported that people with communication difficulties were less likely to have used the service than others.[23] In Hong Kong, problems had also been identified when the Hospital Authority introduced the telephone booking system to general out-patient departments.[24] Our study also showed that approximately 92% of the participants preferred to have calls answered by staff directly, rather than an automated service system, of which old people could have difficulties with. In the development of the Health Call Centre, it is important to consider its accessibility and having a system which old people can easily call directly and operate with ease.

Caregivers were significantly more supportive to the development of a Health Call Centre; support to caregivers was cited as one of the top three priorities that should be incorporated. These results indicated that current services provided to caregivers might not fully meet their needs, though they play a key role in disease management. According to the National Family Caregivers Association, more than 50 million people provide care for a chronically ill, disabled or aged family member or friend during any given year in the United States.[25] Moreover, the value of services family caregivers provide for 'free' is estimated to be US$306 billion a year.[26] In addition to informational needs for caring patients,[27] caregivers also need to be provided with emotional and psychological support.[28] Caregiver burden is likely to be higher when they have lower levels of family and social support.[29] The burden is liable to exacerbate physical health and especially psychological problems, which in turn undermine their caregiving capacity.[30]

In this study, 40% of participants reported that they had chronic disease. However, our results did not show that patients with chronic disease reflecting a need to develop a Health Call Centre more than those without any chronic conditions. Older people are usually at high risk of having chronic conditions. This study found that approximately 89% of those aged 65 years or more had at least one chronic illness. As mentioned previously, older people could have difficulties using telephones and hotlines due to hearing problems. This could be one explanation for their preference. Besides, these patients are used to consulting doctors and other health professionals face to face, whenever they have health problems.

In our culture, patients, especially the elderly, may not be used to receiving consultations or medical advice via a telephone. To enhance the use of a Health Call Centre by patients with chronic conditions and older people, the telephone system should be easy to operate and user-friendly for the elderly.

Limitations

This study must be understood within the context of its limitations. The questionnaire developed was based only on literature review and expert opinions. No qualitative study was conducted to collect a range of responses from patients to inform the development of the questionnaire. However, experts and patients participating in the pilot study had provided feedback to ensure the test items matched the objectives of the study, and helped to improve its clarity. We drew our sample from only two GOPCs, and these clinics were not fully representative. Compared with the general population in Hong Kong, our participants were older, had lower levels of education and lower individual monthly incomes,[31,32] which could be explained by a predominance of older subjects and exclusively public service users among those we interviewed.[31] Despite these limitations, this study provides unique data on the views about setting up a Health Call Centre from patients in Hong Kong.

Conclusion

This is the first study to assess the preferences for the development of a Health Call Centre and the perceived needs of patients in Hong Kong. The Health Call Centre should be easily accessed by old people. Services provided should meet the general needs of all patients and caregivers, including basic health and chronic disease information, current health conditions and treatment information, and caregiver support advice.

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