


Outpatient satisfaction with primary health care services in Vietnam: Multilevel analysis results from The Vietnam Health Facilities Assessment 2015

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Abstract

Patient satisfaction has implications for resource distribution across primary, secondary, and tertiary care, as well as accessibility of quality services and equity of service delivery. This study assessed outpatient satisfaction with health services and explored the determinants at the individual and contextual levels in Vietnam. Data on 4372 outpatients were extracted from the Vietnam Health Facility Assessment survey 2015. Three levels of logistic regression were applied to examine the association between outpatient satisfaction and three types of explanatory variables. Outpatients satisfied with their community health center or district hospital accounted for relatively high proportions (85% and 73%, respectively). Patients' age, occupation, and individual characteristics were significant predictors of patient satisfaction, whereas provincial level factors were not significantly associated with the dependent variable. When individual-level characteristics were controlled, outpatients who had a longer waiting time for health services were less likely to report being satisfied. Interventions for improving outpatient satisfaction should pay attention to simplifying the health procedure at health facilities to reduce patients' waiting time and increase their examining time.

Keywords

multilevel, outpatient, patient satisfaction, primary healthcare services, Vietnam

Introduction

As health care becomes increasingly market-driven, service should focus on customers. Thus, the influence of patients' characteristics on their self-reported health care experiences merits research. Patient satisfaction is an important indicator to measure the quality of health services; it captures patient perceptions of the quality of services delivered by health facilities (Aiken et al., 2012; Batbaatar et al., 2017; Bjertnaes et al., 2012; De Salins et al., 2016; Lin et al., 2010). It is influenced by a mixture of perceived need, patient's expectations, and the experience of care. The literature on patient satisfaction discusses nine provider-related determinants of health services that might affect patient satisfaction, namely, technical care, interpersonal care, physical environment, access (accessibility, availability, and finances), organizational characteristics, continuity of care, and the outcome of care (Batbaatar et al.,

2017). In particular, the technical care, interpersonal care, continuity of care, and outcome of care play an important role in increasing patient satisfaction levels, and they have the most significant impacts on variations in patient satisfaction (Batbaatar et al., 2017; Sitzia and Wood, 1997).

Several factors have been identified to affect patient satisfaction, and they can be measured by directly asking patients to rate the quality of services received or to report their subjective experiences (Crow et al., 2002). The patient-related determinants of patient satisfaction include 13

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factors related to demographic, health, and psychological status: age, gender, education, socio-economic status, marital status, race, religion, geographic characteristics, visit regularity, length of stay, health status, personality, and expectations. However, the strength of associations between these proposed determinants and satisfaction is weak and variable (Aiken et al., 2012; Batbaatar et al., 2017; Grondahl et al., 2013). Age is the most consistent determinant of satisfaction. More precisely, older patients expressed greater satisfaction than the younger ones (Danielsen et al., 2010; De Salins et al., 2016; Kontopantelis et al., 2010; Lin et al., 2001; Sanchez-Piedra et al., 2014; Schoenfelder et al., 2011). Evidence concerning social class is inconsistent and emerges as more important in developed countries. Regarding healthcare provision, measures of accessibility, availability, and convenience are consistently associated with higher satisfaction. Much attention has been directed to the interpersonal aspects of the patient-professional relationship (Crow et al., 2002). Jugde and Solomons (2009) also found a strong regional influence on patients' satisfaction.

Although a large number of studies have addressed patient satisfaction, a firm consensus regarding its determinants remains elusive. One reason is the lack of a common theoretical framework for patient satisfaction, and another is the fact that patient satisfaction is a complex and multidimensional concept with numerous determining factors (Sanchez-Piedra et al., 2014). The majority of studies have indicated that patient satisfaction can be divided into two main groups of factors, namely, the patient- and provider-side determinants (Aiken et al., 2012; Crow et al., 2002; Gill and White, 2009; Grondahl et al., 2013; Sanchez-Piedra et al., 2014; Sitzia and Wood, 1997; Vranceanu and Ring, 2011).

The health care system in Vietnam consists of four levels: central, provincial, district, and commune. Primary health care services are concentrated at the grassroots level (district and commune levels). In Vietnam, the grassroots health system is the main entry point of the population into the public health system (The World Bank, 2016). People tend to prefer using health care services at higher levels (i.e. provincial and central levels), but a number of health services that used to be delivered at higher-level facilities are gradually becoming available at the district and commune levels. The health reports (Orb et al., 2014; Waters et al., 2016) have indicated that curative services at the grassroots level have failed to attract people or gain their trust. Several studies have shown patients' dissatisfaction with the facilities (e.g. facility infrastructure, location, and available equipment), waiting time, attitudes of health staff, use of health insurance cards, and inadequate hygiene (Health Examination Administration-Ministry of Health, 2015; Ministry of Health, 2015). Limited and ineffective curative care at the grassroots level in Vietnam has remained an unsolved problem leading to hospital overcrowding at higher levels. Indeed, 54%–65% of patients visiting central

hospitals suffer from diseases or health conditions that can be diagnosed and treated at the lower levels (Ministry of Health, 2015).

Patient satisfaction is a matter of great concern to health providers, patients, policymakers, community members, and other stakeholders in the health sector. Improved satisfaction among patients with primary health care services at the grassroots level will help increase their use of services at this level, which would contribute to reducing overcrowding at higher-level hospitals. Information on satisfaction, based on users' perception and needs, allows policymakers to identify areas for improvement. The impact of contextual factors on patient satisfaction needs to be explored to promote a better understanding of the determinants of patient satisfaction. We are not aware of any other studies on overall patient satisfaction that have used multilevel analysis to estimate and control for provincial-level factors.

Vietnam District and Commune Health Facility Survey 2015 (VHFS2015) was conducted by The Health Strategy and Policy Institute (HSPI) of Vietnam's Ministry of Health (MOH) in partnership with the World Bank Group (2016). Its purpose was to collect information on the following: patient experiences; availability of key input (infrastructure and medicines) at each facility; qualifications, experience, and knowledge of doctors; and actual practice of doctors as recorded indirect observations of clinical practice. This study assessed the pattern of outpatient satisfaction with primary health care services in Vietnam and associated factors at both the individual and contextual levels using the dataset from the VHFS2015.

Methods

Data sources

This analysis used secondary data from the Vietnam District and Commune Health Facility Survey 2015 (VHFS2015), with variables related to provincial-level factors extracted from (1) Vietnam Health Statistical Yearbook 2015 and (2) Statistical Yearbook of Vietnam 2015.

The VHFS2015 adopted a cross-sectional design, with six provinces representing six distinct geographical regions selected for data collection. Dien Bien Province was selected because of its large ethnic minority population and its status as one of the poorest provinces in Vietnam. Meanwhile, Hanoi was chosen for being one of the wealthiest areas. The four other provinces (Binh Dinh, Dak Lak, Dong Nai, and Dong Thap) were selected for reporting socioeconomic characteristics typical of their respective regions. The sample of the VHFS2015 was commune health stations and DHs located in the communes and districts that corresponded with the selected enumeration areas (clusters) in the household survey. In each facility, apart from facilities' overall information, data on a sample of doctors and inpatients and outpatients who sought health

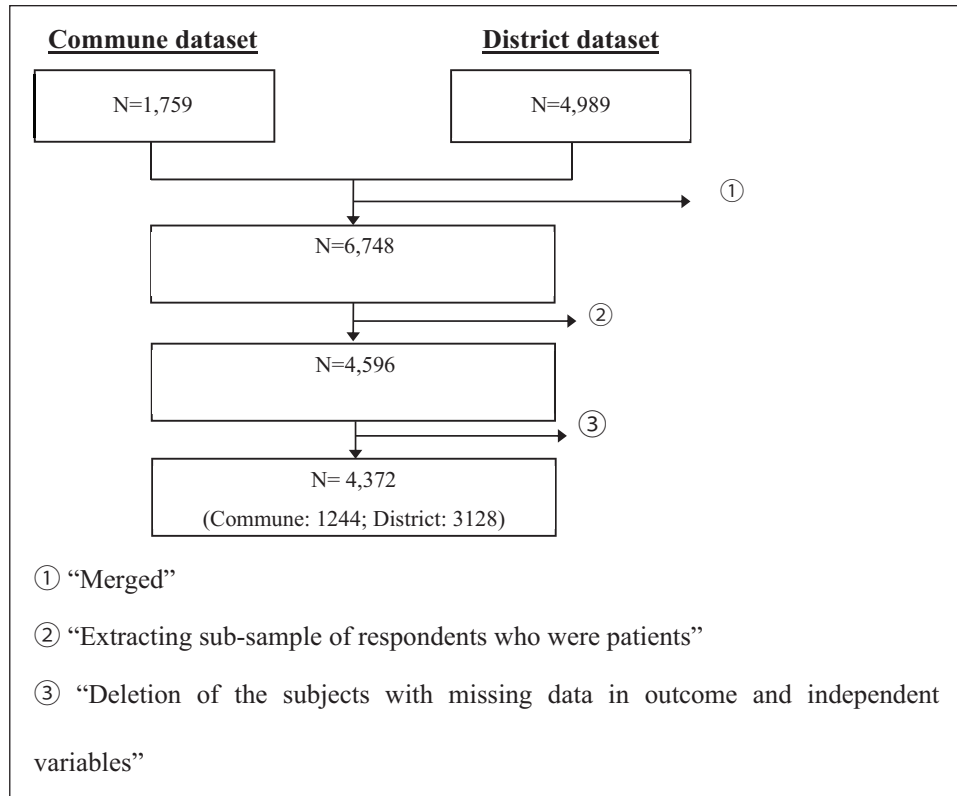


Figure 1. Derivation of study samples.

care at those facilities between May and July 2015 were collected. The interviewers in this study were staff members at the HSPI. They were trained to obtain informed consent and conduct interviews with patients in health facilities. The data collection and primary findings of the survey are described in detail elsewhere (The World Bank, 2016).

The Vietnam Health Statistical Yearbook, 2015, published by the MOH, provides information for various studies, as well as analyses and assessment of health programs and sets strategic targets for the continuing time period (Ministry of Health, 2016). The contents of the Health Statistical Yearbook are based mainly on health reports submitted by 63 Provincial Health Offices in 2015, data from departments, institutes, and national health programs, the General Statistics Office (GSO), and other ministries.

The Statistical Yearbook of Vietnam 2015, an annual publication by the GSO, contains basic data on the socio-economic characteristics of the population, as well as geography, economy, and government services, including those that focus on the health, safety, and welfare of the population, at the national, regional, and provincial levels (General Statistics Office, 2016).

Study participants

Outpatient interviews were conducted and analyzed to identify the factors affecting patient satisfaction with district and

communal clinical services. At the district level, two doctors in each DH were selected for clinical observation, and all of their patients were selected for surveys. At the communal level, all outpatients examined by the doctors and assistant doctors responsible for patient examination per facility were chosen. The criteria for inclusion in this study were as follows: (1) those who were patients; (2) at least 18 years old. We restricted our study sample to those who had non-missing responses on all selected variables. Altogether, data from 3128 outpatients at selected DHs and 1244 outpatients at selected CHCs were used for the analysis. The derivation of study samples is shown in Figure 1.

Study variables

Dependent variable. The binary outcome of interest was patient satisfaction: satisfied or unsatisfied. The outcome variable was created by dichotomizing a five-level categorical variable: (1) Satisfied (Satisfied and Very satisfied) and (2) Unsatisfied (Very unsatisfied, Unsatisfied, and Normal). Patients participating in this study were asked how satisfied they were with health services during visits. This variable was created based on the respondents’ answers to one question: “Are you satisfied with the services of the facility for this visit?” No distinction was made between doctors and assistant-doctors, in terms of patient satisfaction.

Independent variables. The selection of independent variables was informed by the literature, including variables at the level of the patient, health care provider, and province, as follows.

Individual-level factors. We included the patients' demographic (age, gender, and ethnicity) and socioeconomic variables (education, poverty, occupation, and marital status). The household wealth status variable captured underlying long-term wealth based on ownership of consumer goods.

Health care provider-related factors. We also extracted the health insurance status of patients (yes or no). Patient access to health facilities was assessed by the following: distance from home to the health facility, waiting time for receiving health services, and examining time. "Waiting time" referred to the time spent waiting from the patient's arrival at the health facility until care is provided. "Examining time" means the "time spent with the doctor," including physical examination, discussion of findings, and treatment.

Provincial-level factors. The provincial-level variables included the health budget per capita, percentage of children aged under 1 year who were fully vaccinated, and poverty rate.

Data analysis

Principal component analysis was used to derive wealth scores, which were used to rank households into wealth quintiles from the poorest to the wealthiest. Poverty status (poverty and non-poverty) was dichotomized from a five-level wealth index: (1) Poverty (poorest and next-poorest groups) and (2) non-poverty (the third, fourth, and the richest groups).

Descriptive statistics including frequencies and cross-tabulations were used to shed light on the distributions of key variables in this study. We have used the social-ecological framework (Sallis et al., 2008) for multilevel analysis, this model describes the interactive characteristics of individuals and environments that underlie health outcomes/person perspective. To account for the hierarchical structure of the data, in which individuals (level 1) were nested in a health facility (level 2), and each facility was again nested within a province (level 3), and to identify determinants at multiple levels, we fitted a series of three-level random intercept logistic models. Model 1, a three-level empty model, was fitted without including individual variables. Variation in the probability of patients' satisfaction was partitioned across the three levels. In model 2, the individual model, only individual-level factors were included. The full model, model 3, expanded model 2 by adding provincial-level factors.

For each model, the results of the fixed effects (measures of association) were shown as odds ratios (OR) with 95% confidence intervals (CIs). The results of random effects (measures of variation) were presented as the variance and intra-class correlation coefficient (ICC) at the health facility and provincial levels. A p -value < 0.05 was regarded as statistically significant. Statistical analyses were performed using STATA version 13.0.

Ethical considerations

VHFS2015 is a national survey developed by HSPI. VHFS2015 reports and datasets have been officially released for reference and use (Vietnam-District and Commune Health Facility Survey 2015, 2015). This study was based on secondary datasets with all personal identity information removed. All information in the original dataset was collected confidentially.

Results

Derivation of samples

Figure 1 shows the derivation of study samples, after applying the exclusion criteria; the study included 4372 patients for analysis.

Characteristics of the study sample

Out of the 4372 patients in this analysis, 28.45% sought health care (examination/treatment) at CHCs, whereas 71.55% did at DHs (Table 1). Overall, the mean (SD) age of patients was 51.44 (17.2) years. Approximately 60% of the patients were female, and 78% were married. More than a third (33%) of the patients reported being farmers, and 50% had less than secondary school education. The Kinh patients accounted for 90.78% of all patients. Dong Thap Province had the highest percentage of patients (27.52%), followed by Dong Nai (20.2%); the lowest figure was found in Dien Bien, at 8.2%. The richest patients formed 21.5%, as opposed to 17.25% in the poorest group (Table 1).

In Table 2, at the time of the interview, 95% of the patients owned health insurance cards (91.64% at the communal level and 96.0% at the district level). A total of 7.57% of patients sought health care at the studied health facilities for the first time, whereas 37.79% of them visited those facilities monthly, and about half of the patients indicated visiting "sometimes." The median (Interquartile Range: IQR) distance from a patient's home to a health facility was 1 (2.4) km for a CHC and 5 (8.0) km for a DH. Patients spent a median (IQR) of 5 (10) minutes of waiting time at the CHC, compared with 30 (50) minutes at the DH. The median (IQR) length of time for examination (min) of patients was similar in both groups, at 5 (5) minutes (Table 2).

Table 1. Socio-economic characteristics of outpatients who used health care services.

Characteristics	Commune health center (n = 1244; 28.45%)		District hospital (n = 3128; 71.55%)		Total (N = 4372)	
	n	%	n	%	n	%
Age: mean (SD)	54.19 (18.15)		51.74 (16.77)		51.44 (17.21)	
Gender						
Male	450	36.17	1304	41.69	1754	40.12
Female	794	63.83	1824	58.31	2618	59.88
Marital status						
Single	108	8.68	300	9.59	408	9.33
Married	936	75.25	2473	79.06	3409	77.97
Separated/divorced	29	2.33	55	1.76	84	1.92
Widowed	171	13.75	300	9.59	471	10.77
Education level						
Illiterate	144	11.58	179	5.72	323	7.39
Know how to read and write	295	23.71	556	17.77	851	19.46
Primary school	294	23.63	760	24.3	1054	24.11
Secondary school	274	22.03	917	29.32	1191	27.24
High school	134	10.77	424	13.55	558	12.76
Above high school	96	7.72	290	9.27	386	8.83
Unknown	7	0.56	2	0.06	9	0.21
Ethnicity						
Kinh	1075	86.41	2894	92.52	3969	90.78
Others	169	13.59	234	7.48	403	9.22
Occupation						
Farming	411	33.04	1031	32.96	1442	32.98
Paid employee	137	11.01	464	14.83	601	13.75
Service/trading	82	6.59	224	7.16	306	7.0
Self-employed	111	8.92	253	8.09	364	8.33
Retired	39	3.14	348	11.13	387	8.85
Old age and dependent	320	25.72	497	15.89	817	18.69
Student	38	3.05	127	4.06	165	3.77
Others	106	8.52	184	5.88	290	6.63
Wealth index						
Richest	402	32.32	537	17.17	939	21.48
Fourth	273	21.95	679	21.71	952	21.77
Middle	215	17.28	690	22.06	905	20.70
Second	202	16.24	620	19.82	822	18.80
Poorest	152	12.22	602	19.25	754	17.25
Provinces						
Dong Thap	422	33.92	781	24.97	1203	27.52
Dong Nai	245	19.69	638	20.40	883	20.20
Dak Lak	164	13.18	541	17.30	705	16.13
Binh Dinh	114	9.16	377	12.05	491	11.23
Dien Bien	142	11.41	216	6.91	358	8.19
Hanoi	157	12.62	575	18.38	732	16.74

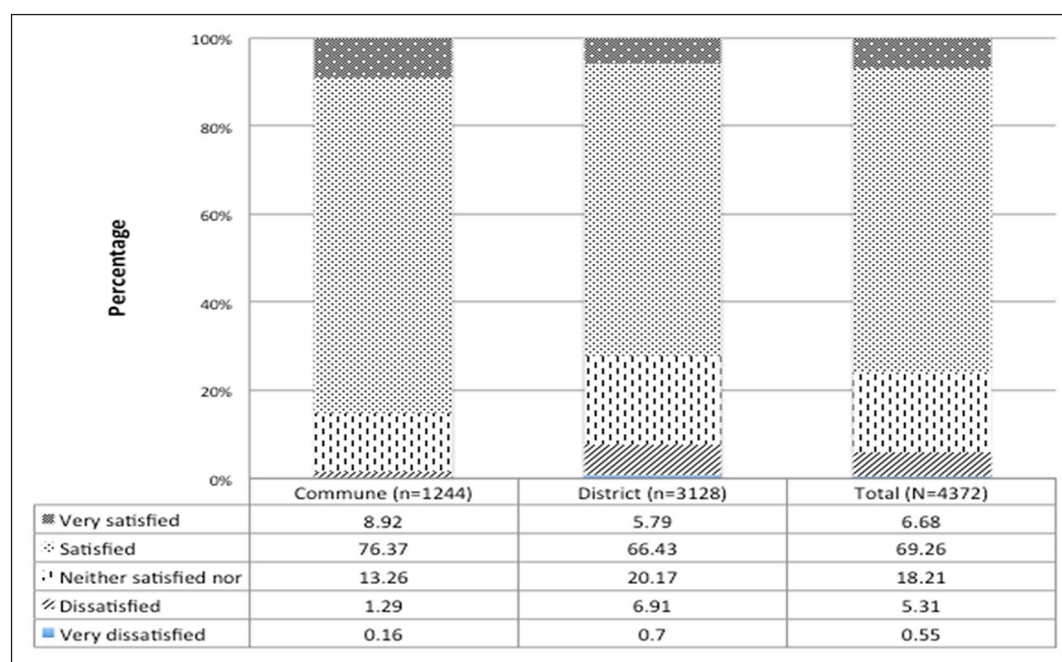
Pattern of patient satisfaction with health care services

Figure 2 shows the results of the self-assessment of patient satisfaction with health services by level of health facility.

The percentage of patients satisfied with CHCs was 85% (95% CI: 82.9%–86.8%), which was higher compared with DHs (72.8%, (95% CI: 71.2%–74.3%); $p < 0.01$). Overall, 76.3% (95% CI: 75.0%–77.5%) of the patients reported being satisfied with the health services.

Table 2. Information about health insurance status and access to health care services among the study outpatients.

Characteristics	Commune health center (n = 1244)		District hospital (n = 3128)		Total (N = Thap 4372)	
	n	%	n	%	n	%
Have health insurance						
Yes	1140	91.64	3003	96.0	4143	94.76
No	104	8.36	125	4.0	229	5.24
Frequency of visiting the studied health facility						
The first time	78	6.27	253	8.09	331	7.57
Monthly	482	38.75	1170	37.40	1652	37.79
Quarterly	52	4.18	127	4.06	179	4.09
Sometimes	564	45.34	1485	47.47	2049	46.87
Others	68	5.47	93	2.97	161	3.68
Distance from home to health facility (km): median (IQR)	1 (2.4)		5 (8.0)		3 (6.5)	
Waiting time: median (IQR)	5 (10)		30 (50)		15 (25)	
Examining time: median (IQR)	5 (5)		5 (5)		5 (5)	

**Figure 2.** Patient's satisfaction by level of health facility (N = 4372).

Factors associated with patient satisfaction

Table 3 shows the adjusted OR for patients who were satisfied versus not satisfied with health services in 2015 from the three models. In the empty/null model, the proportion of the patient satisfaction explained by between-health facility variance of the total variance (ICC), was small ($ICC_{\text{Health facility level}} = 2.26\%$), whereas a larger proportion of the total variance explained by between-province variance was identified ($ICC_{\text{province}} = 6.14\%$).

In models 1 and 2 (Table 3), age, education, and occupation were significantly associated with patient satisfaction ($p < 0.05$). As the patient's age increased by 1 year, the odds of patient satisfaction increased by 1% (95% CI: 0.5%; 2%). The odds of satisfaction among patients who could read and write was about 1.48 times (95% CI: 1.08; 2.09), compared with 1.52 times (95% CI: 1.09; 2.12) among those who completed primary school education. These figures were both higher than that for illiterate patients. For farmers, the

Table 3. Three-level logistic regression for determinants of outpatient satisfaction (n = 4372).

Factors		Empty model	Model 1 aOR (95% CI)	Model 2 aOR (95% CI)
Fixed effects				
Individual-level				
Demographic factors	Patient's age (years)		1.01 (1.00; 1.01)**	1.01 (1.003; 1.01)**
	Gender			
	Male	Ref		Ref
	Female	1.08 (0.92; 1.26)		1.08 (0.92; 1.26)
	Ethnicity			
	Kinh	Ref		Ref
	Non-Kinh	1.09 (0.79; 1.51)		1.07 (0.76; 1.50)
Socioeconomic factors	Marital status			
	Single	Ref		Ref
	Married	0.76 (0.58; 1.00)		0.76 (0.58; 0.99)*
	Divorced/window/separate	0.78 (0.54; 1.14)		0.79 (0.54; 1.14)
	Poverty			
	Not poor	Ref		Ref
	Poor	1.02 (0.86; 1.21)		1.03 (0.85; 1.20)
	Education level			
	Illiterate	Ref		Ref
	Know how to read and write	1.45 (1.06; 2.07)*		1.48 (1.08; 2.09)*
	Primary school	1.52 (1.09; 2.11)*		1.52 (1.09; 2.12)*
	Secondary school	1.27 (0.91; 1.77)		1.28 (0.91; 1.78)
High school and above	1.18 (0.99; 1.41)		1.15 (0.81; 1.63)	
Occupation				
Non-farmer	Ref		Ref	
Farmer	1.21 (1.01; 1.41)		1.18 (0.99; 1.41)	
Health provider-related factors	Health insurance			
	No	Ref		Ref
	Yes	1.29 (0.93; 1.78)		1.25 (0.90; 1.74)
	Frequent to visit health facility			
	The first time	Ref		Ref
	Monthly	1.6 (1.20; 2.13)**		1.57 (1.18; 2.09)**
	Quarterly	1.56 (1.17; 2.27)*		1.55 (1.13; 2.24)
	Sometime/rarely	1.33 (0.98; 1.62)		1.32 (0.98; 1.61)*
	Waiting time	0.99(0.98; 0.99)***		0.99 (0.98; 0.99)***
	Examining time	1.05 (1.03; 1.07)**		1.05 (1.03; 1.07)**
Distance from home to health facility	0.99 (0.98; 1.00)		0.99 (0.98; 1.00)	
Provincial-level factors				
	% fully vaccination among children under 1 year old			0.97 (0.85; 1.10)
	Health Budget per Capita			0.99 (0.98; 1.00)
	% poverty			1.07 (0.99; 1.15)
Random effects				
	Province (variance)	0.136	0.129	0.075
	Health facility level (variance)	0.079	0.022	0.029
	ICC _{province} (%)	6.14	4.40	3.08
	ICC _{Health facility level} (%)	2.26	0.65	0.85

ICC: intra-class correlation coefficient.

*p < 0.05. **p < 0.01. ***p < 0.001.

Marginally significant at p = 0.05.

odds of their satisfaction with health services was about 1.21 times (95% CI: 1.02; 1.41) higher than that for non-farmers.

In the full model (model 3, Table 3), for each additional minute the health staff spent on a patient's health

examination, the odds of patient satisfaction increased by 5% (95% CI: 3%; 7%). As the waiting time for health services increased by 1 minute, the odds of patient satisfaction decreased by 1% (95% CI: 1%; 2%). As the patient's age increased by 1 year, the odds of patient

satisfaction increased by 1% (95% CI: 0.5%; 2%). Patients who visited the health facility frequently (monthly or quarterly) had higher odds of satisfaction compared with patients who visited the health facility for the very first time. The provincial-level variables showed no significant association with patient satisfaction regarding health services ($p > 0.05$).

Discussion

This study reports the results of VHFS2015 regarding patient satisfaction. As our main finding, our analyses revealed high percentages of patients satisfied with health services at CHCs and DHs. Overall, 77% of patients were satisfied with health services; this result is similar to those in other studies (Sanchez-Piedra et al., 2014).

Consistent with recent literature (Bjertnaes et al., 2012; Kersnik, 2001; Kroneman et al., 2006; McMullen and Netland, 2013; Orb et al., 2014; Waters et al., 2016), we found a negative association between waiting time for health services and patient satisfaction. This suggests the need to identify inefficiencies in service delivery. The longer patients wait for health services, the less satisfied they are. Patients usually feel nervous, tired, and stressed when waiting to see health staff, leading to dissatisfaction. However, the association between perceived and actual waiting time is not well understood; patients may overestimate the amount of time they spend waiting for appointments or to see health care staff.

We found that time spent with the doctor was significantly associated with reported satisfaction of patients after adjusting for individual patient characteristics and health provider-related variables. Increased time with health care personnel was associated with increased patient satisfaction, consistent with the literature on primary care (Batbaatar et al., 2017; Bikker and Thompson, 2006; Lin et al., 2001; Waters et al., 2016). A perfunctory examination ruins the patient's trust in the health staff, leading to a negative perception of the doctor's competence or effort, and therefore, dissatisfaction with health care services.

Patient satisfaction might result from the quality of primary health care. Nonetheless, other probable reasons also need to be taken into consideration. The mean age of patients in our study was 51.44 years. As younger patients tend to give more "No" answers to survey questions (Danielsen et al., 2010; De Salins et al., 2016; Ganasegeran et al., 2015; Sanchez-Piedra et al., 2014), patient satisfaction with health services in our study might be overestimated. The majority of studies on patient satisfaction have concluded that the older the patient, the more satisfied with health services they are (Danielsen et al., 2010; De Salins et al., 2016; Ganasegeran et al., 2015; Kontopantelis et al., 2010; Lin et al., 2001; Sanchez-Piedra et al., 2014; Schoenfelder et al., 2011). Our results confirmed such an association between patient age and patient satisfaction.

Older adult patients, who typically have more complicated medical conditions, tended to report higher satisfaction with health services compared with younger patients. One possible reason regarding the higher satisfaction rating of older patients could be the different treatment they receive; health care staff may be gentler on them than with younger patients. Danielsen et al. (2010) highlighted the importance of age in relation to health service experience, finding that the greater satisfaction of older individuals with health services is mediated by the fact that they have more time to seek health services at health facilities (e.g. frequent patients). Meanwhile, Kontopantelis et al. (2010) noted that the differences in patient satisfaction by age group may result from either difference in actual care patients received or different response tendencies by age.

Patients who visited health facilities frequently (monthly or quarterly) had higher odds of satisfaction than others. A possible explanation is that in this study we only selected patients coming over the health facilities, including those who returned because they had higher perceived satisfaction. However, as we conducted our study at the health facilities, we could not evaluate the satisfaction of those who did not return. Kersnik (2001) demonstrated a strong correlation between higher frequency of health facility visits and patient satisfaction with the health care system, arguing that regular visits reflect patients' satisfaction with the facility. Health service satisfaction likewise predicts patients' intention to return for similar services in the future (Kersnik, 2001; Lin et al., 2010; Nabbuye-Sekandi et al., 2011; Wouters et al., 2008). Higher satisfaction may be due to the development and maintenance of good relationships and connections between the patient and the health staff, formed over repeated visits. Kersnik (2001) claimed that this continuous relationship is the most important predictor of patient satisfaction.

Our analysis pointed to a positive association of either knowing how to read and write or having primary school education, but not of illiteracy, with higher levels of satisfaction. This finding is consistent with previous results (Nabbuye-Sekandi et al., 2011). Nabbuye-Sekandi et al. (2011) considered that unlike illiterate patients, those with relatively low education levels are able to follow the health facility's instructions and thus have higher mean satisfaction scores. However, our analysis showed no significant difference in the level of satisfaction between patients with secondary school education and above and their illiterate counterparts. Our results may be due to the potentially higher expectation for good services by the more highly educated patients (Nabbuye-Sekandi et al., 2011).

Consistent with the literature, patient occupation was related with patient satisfaction in our study. Farmers were more satisfied with health services. This finding may be explained by the same mediating mechanism that Danielsen found with age. Patients who were farmers were free to take time off work to visit health facilities and therefore

tended to be more satisfied. Kontopantelis et al. (2010) pointed out that the full-time employed are the least satisfied, whereas retired people are the most satisfied with health services. However, the difference could also be because expectations are different in varying employed groups, even when their experience is similar.

We observed a level of clustering for patient satisfaction across a wide range of provinces. Thus, in most of the provinces, variation in patient satisfaction was determined at the level of health facilities rather than the area level. Provincial factors, such as full vaccination for children under 1-year-old, health budget per capita, and percentage of population in poverty, showed no association with patient satisfaction. This finding may be explained by the difference in expectations of patients living in different provinces: people residing in provinces with high poverty rates tend to have lower expectations of health care services compared with those living in wealthier areas (Bleich et al., 2009). Besides that, VHFS2015 was conducted in the public health facilities at the grassroots level, most of the patients who received health care services have a health insurance (the percentage of patients with health insurance in our survey was 96%). In Vietnam, most patients enjoy comprehensive coverage from Social Health Insurance in both reimbursement rate and service list in the health facilities at grassroots level.

Strengths and limitations

A notable strength of this study is that it assessed the satisfaction of patients using health care services at the grassroots level. The national policy in Vietnam focuses on capacity building of grassroots-level health care services, to attract citizens to seek health care services at locally provided primary health care facilities, which would reduce overloading at secondary- and tertiary-level hospitals. Another strength of our study is the application of the three-level random intercept logistic modeling technique to deal with the hierarchical structure of patient satisfaction data. Different health facilities may provide different quality of care, the analysis of the possible associations of provincial-level, health facility-level, and individual-level factors with patient satisfaction requires more attention. The Government of Vietnam has just issued an important policy document (Primer minister decision no 2348/QĐ-TTg) on approval of the master plan on development of capacity of grassroots level of health care (Government of Vietnam, 2016), in which improving patient satisfaction is one among important target, and the evidence generated from this study could be useful in tracking the progress toward the target. Meanwhile, this study had a number of limitations. First, we analyzed secondary data, making it impossible to rectify missing data relating to records and variables, as well as possibly leading to inaccurate inferences. Although including outpatients from different provinces increased the generalizability of the data, it also

increased the effect of different provincial characteristics. The study attempted to treat the dataset as a hierarchical form with some provincial variables in the full model to mitigate this possible effect. Second, VHFS2015 was a cross-sectional study; therefore, it did not permit causal inferences regarding the results. Third, inpatients' satisfaction levels were not captured in our study. Fourth, although statistically significant, the differences by independent variable in the percentage of patients who were satisfied were small; as such, the implication for clinical practice may be negligible. Fifth, the study may be subject to respondent bias as most patients reported inaccurate waiting times. Finally, regarding the high levels of satisfaction, there may have been a risk of acquiescence and a social desirability bias that could have resulted in an over-reporting of satisfied patients, possibly compounded by the use of the single-item questions to evaluate overall patient satisfaction. Most patients tend to give positive answers if asked about how satisfied they were, even when they have complaints on specific aspects of the received care (Bernhart et al., 1999; Collins and O'Cathain, 2003; Wouters et al., 2008).

Conclusions and recommendation

The percentage of patients satisfied with the health services at CHCs and DHs was high (85% and 73%, respectively). Patient satisfaction is dependent on numerous complex factors, including patient characteristics and health provider-related factors. The most important determinant of patient satisfaction was examining time, followed by waiting time, the patient's age, and frequency of visiting the studied health facility. Our study suggests that interventions to improve patient satisfaction should pay attention to simplifying the health procedure at health facilities to reduce patients' waiting time and increase their examining time.

Meanwhile, Vietnamese researchers need to develop a more comprehensive and context-based assessment tool to examine factors affecting patients in future research.

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Ethics and consent


VHFS2015 is the national survey developed by HSPI. VHFS2015 reports and datasets have been officially released for reference and use.²³ This manuscript has been based on secondary datasets

with all personal identity information removed. All information in the original dataset was collected confidentially.

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