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Ecology of healthcare in an urban and rural area of Gampaha district of Sri Lanka: a community-based prospective study on symptom prevalence and healthcare utilization

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Abstract

Background The 55 million visits to government outpatient departments (OPD) in Sri Lanka in 2014, is estimated to increase to 100 million in 2027. The private OPD visits in 2014 was estimated at 50 million per annum. In primary care, there is a paucity of medical records, research on symptoms and healthcare seeking behaviour. We aimed to determine the symptom prevalence and healthcare seeking pattern of residents in Gampaha district, Sri Lanka.

Methods A community-based prospective study using a participant-held symptom diary and interviews were conducted in two areas, Ragama (urban) and Mirigama (rural), in the Gampaha district of Sri Lanka during May–June 2018. For each area, three midwife areas were randomly chosen. Clusters of 15–20 households were selected from 5–6 random locations from each midwife area.

Results 2046 individuals from 557 households participated. Majority were females ($n=1127$, 55.1%). There were 1207 (59%) from Mirigama area. Among participants, 1919 (93.8%) reported symptoms. Phlegm ($n=4200$, 7.0%), leg pain ($n=3943$, 6.6%) and cough ($n=3153$, 5.3%) were top symptoms among all symptoms reported; the musculoskeletal group ($n=18{,}081$, 30.4%) predominated. 924 (45.1%) participants sought treatment, 763 out of 2046 participants (37.3%) sought allopathic treatment. Private sector visits were more ($n=515$, 25.2%). The decision to seek private or public healthcare services was influenced by income. Persons with higher income preferred a private institution. Of the 46 (2.3%) hospital admissions, 42 (91.3%) were to public hospitals, of which, 19 (41.3%) were to teaching hospitals, and 4 (0.9%) to a private institution.

Conclusions The population had a high prevalence of symptom reporting (93.8%) and a high healthcare seeking behaviour (45.2%). Among those who sought allopathic treatment, the majority preferred private ambulatory care. 90% of hospital admissions (42/47) were to public hospitals. Provision of ambulatory care services should be prioritized in further development of the health services.

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Keywords Ecology of healthcare, Morbidity, Symptom prevalence, Healthcare seeking behaviour, Sri Lanka

Background

Sri Lanka is a low-middle-income country, with a population around 22 million and a life expectancy at birth of 76.8 and 72.0 years for females and males, respectively, during 2011–2013 [1]. With less than 3.2% of Gross Domestic Product (GDP) investment in health, Sri Lanka provides free healthcare at all public hospitals. Almost 95% of inpatient care and 50% of outpatient care are provided by the state sector [2], the rest by the private sector. With limited investments, the health indices are similar to those of more developed countries in the region such as Thailand and Malaysia [3].

The success of the Sri Lankan healthcare system has been attributed to the targeted investments in education and health, the policy focus on primary healthcare including primary care, especially maternal and child healthcare [4]. Preventive services are provided almost exclusively by the Ministry of Health and curative services by both public and private sectors.

The public hospitals are structured as primary, secondary, and tertiary care institutions and outpatient departments (OPD) provide ambulatory care at all levels. Furthermore, part-time practitioners and a few full-time practitioners provide ambulatory curative services for a fee-for-service basis.

There were 55 million OPD visits to public hospitals in 2014 [5]; it is estimated to reach 100 million by 2027 [2]. Current visits to public and private OPDs have reached more than 5 visits/person annually. The estimated two-fold increase, by 2027 will become an unmanageable burden, with dwindling resources for primary care. However, there is no data published routinely by the Ministry of Health [2] regarding ambulatory care morbidity because of a lack of a proper medical record system. Furthermore, there is a paucity of research on how Sri Lankan citizens interact with the health system from symptom identification to seeking healthcare. It is important to ascertain the reasons for the increasing trend in OPD visits; whether due to high symptom prevalence resulting in healthcare seeking behaviour or other associated factors.

Caldwell suggested that good health indices of Sri Lanka may be the result of their high illness sensitivity [6]. He hypothesized that 'Sri Lankans recognize most sicknesses early and take appropriate action; if the first attempt is unsuccessful, they will continue to seek treatment until the condition resolves. If the sickness is life-threatening, treatment sought will almost invariably be western (allopathic) medicine' [6].

White et al. (1961) described the ecology of medical care in the United States [7] which was revisited by Green et.al in 2001 [8]. White et al.'s paper concluded that in a population of 1000 adults over 16 years, in the USA, 750 (75%) will have at least one symptom during a one-month period and 250 (25%) will seek care [7]. In the later study in 2001, out of 1000, 800 (80%) people reported symptoms and 327 (32.7%) sought care [8]. After nearly 40 years, the ecology remains similar despite the expansion of healthcare in the USA. Both studies used data from national health surveys and health cost analyses to calculate the published figures.

In 2012, a survey of the Beijing Urban Population Health Care Service in China, using face-to-face interviews with adults to obtain symptom data, reported that 30% had a symptom in the preceding month and 17% visited a hospital-based outpatient clinic [9].

Studies about the ecology of healthcare provide an important framework for the organization of healthcare, medical education, and research. Healthcare organization varies considerably, between the economically developed and developing countries and so will be the ecology of healthcare. With doubling of visits expected in public OPDs in 2027, it is imperative to focus on ecology of healthcare in Sri Lanka.

Our major objective was to determine the symptom prevalence and healthcare seeking pattern of residents in Gampaha district, Sri Lanka. In this prospective community-based health diary survey, in addition to describing the symptom prevalence and healthcare seeking behaviour, we report on the factors associated with the decision to seek healthcare.

Methods

This community-based prospective cross-sectional study using a health diary was conducted from 11th May to 15th June 2018 in the Gampaha district of Sri Lanka. Gampaha, a district with an estimated population of 2.3 million [10] has 16 Medical Officer of Health (MOH) areas which are subdivided into Public Health Midwife (PHM) areas. Community-based preventive health services in the country are provided through MOH areas. From the 16 MOH areas in Gampaha, Ragama, with a population of 82,000 having urban characteristics and Mirigama with a population of 165,000 with rural characteristics were selected. Three Public Health Midwife (PHM) areas from each MOH area (total 6) were selected randomly.

Sample size and participants

A sample of 540 households was required to estimate a symptom prevalence of 50% having a 95% confidence interval ranging from 45%–55% with a design effect of

1.4. Assuming a dropout rate of 10%, a total of 600 households were required.

Sampling

A multi-stage cluster sampling method was used in the selected MOH areas (Ragama and Mirigama); three midwife areas from each MOH area were randomly selected. From each midwife area (3 each in the Ragama and Mirigama MOH areas), 5—6 houses in separate randomly selected locations were identified as starting points. From these starting points, clusters of 15—20 houses were selected to compensate for potential refusals. Every person living in the selected households was invited to participate in the study. Those who were unable to complete the symptom diary due to various disabilities and lack of support were excluded. Each household and each individual were given a unique identification number. For children, the respective adults were handed the responsibility of completing the diary.

Data collection instruments

Two questionnaires and a symptom diary were developed to obtain data. The first questionnaire focused on family information and the second on individual demographic data. The questionnaires collected baseline details of the individual's health status, demographics and the household socio-economic details.

A participant-held symptom diary comprising 14 pages was developed to cover 7 days of the week specifically for this project. This diary had 55 symptoms which were obtained from (a) a previous study done at the Out Patients Department (OPD) of the Colombo North Teaching Hospital (CNTH) [11], and (b) a literature review to cover symptoms from psychological, social and sexual health areas. The diary was maintained for 4 weeks; four 14-page diaries were distributed, one for each week and collected at the end of each week. For each day, 2 pages of the 1-week diary had to be filled; one page contained the list of 55 symptoms with space to write any additional symptoms, while the other was to record data relevant to health-seeking behaviour (supplementary file 1). Each person in the household was given an individual diary and each member of the household was expected to fill the diary on a daily basis; in the case of children and invalid persons, the mother of the child or a responsible adult, usually the head of the household, was given the task of filling the entries in the symptom diary after training and giving adequate advice; a helpline to the research assistants was provided in case they had any queries.

Pilot study

The diary was pretested by giving it to 20 selected adults from various socioeconomic and educational backgrounds and feedback was obtained. The feedback was used to modify the diary before the pilot study which was carried out in a different PHM area in the Ragama MOH area not included in the main study. The pilot study was helpful in further refining the diary and the questionnaires. The symptoms were coded using the International Classification of Primary Care (ICPC) version 2R.

Data collection

Six research assistants collected demographic data after a one-week training which included the objectives of the study, the study protocol, engaging with the community, data collection and maintaining confidentiality of data.

Research assistants were introduced to the community by the Public Health Midwives which helped to gain the trust of the participants. The research assistants explained the protocol to the interviewee and what was expected of the household members. Informed written consent was obtained from the head of the household/responsible adult prior to data collection.

The interviewer-administered questionnaire had two parts to capture data: (a) household level data, and (b) individual level data. All individuals in the household were invited to participate and relevant information was obtained from the individual or the head of the household. Socio-economic information and details of healthcare facilities in the area and healthcare seeking behaviour of the household were collected. The individual questionnaire obtained demographic information and other details of individual members of the household.

After the initial interviews, the symptom diary was introduced. Each day, the participant had to complete two pages of the diary. If they had symptoms, they had to mark them; if they did not have any symptoms, we requested them to write 'NONE' in the extra space provided in the symptoms page. This was done to encourage the participants to complete the diary on daily basis. Once they marked the symptoms, they were requested to mark the severity of the most important symptom based on their perception. In addition, they had to mark the actions they took for that particular symptom. There were four options that participants could select from; (a) ignored (b) self-treated, (c) sought medical advice, and (d) sought medical treatment. The head of the household or responsible adult was requested to assign a family member to maintain the symptom diaries on a daily basis for one month.

One weekly-diary collected information for one week. The research assistants visited households weekly and collected the previous week's diary after checking for any missing information and gave a new one for the coming week. Furthermore, during each week, they sent reminders to the participants to maintain the diary, either in mobile text message format or by calling a selected person in the household. Prior consent was obtained from

the participants for calling or texting them. Participants completed the symptom diary for 4 weeks.

Data processing and analysis

Data entry was designed with a MySQL database using an interface designed specifically for the study. Extracted data tables were analyzed using SPSS and R statistical software. Frequencies and descriptive statistics were used to describe data. Frequency distributions were generated and associations with factors which were assumed to be associated with symptom reporting and healthcare seeking behaviour were tested. Chi square tests and binary logistic regression analyses were used to find the effect of different factors on symptom reporting, healthcare seeking behaviour and decision on choosing a government or a private sector healthcare institution for treatment.

Ethics statement

The study adhered to the Declaration of Helsinki and ethics clearance was obtained from the Ethics Review Committee (ERC) of the Faculty of Medicine, University of Kelaniya, Sri Lanka (ERC number – P/273/11/2017). Before inviting the participants, an information sheet was given, and written consent was obtained. When there were minors (12–17 years), informed consent from parents or guardians was obtained before proceeding with data collection. All the participants were given the opportunity to withdraw from the study at any time.

Results

We invited 2330 individuals from 557 households and 2046 participated with response rates of 97% and 77% from Mirigama and Ragama areas, respectively. 1207 (59%) participants were from the Mirigama (rural) area. 1127 (55.1%) were females. More than 55% were between 18–59 years with a mean age 32.8 years (SD = 21.2), age ranging from one month to 93 years (Table 1).

46.6% of adult participants were educated above General Certificate of Education Ordinary Level (GCE O/L), 39.1% were employed, 7.8% earned less than Rs 10,000, while 4.9% had an income above Rs. 50,000. About 9.3% of the adult population smoked and 22.2% had consumed alcohol at least once in the past 12 months (Table 1).

A total of 59,477 symptoms were marked from the 55-symptom list during the study period. There were 1919 (93.8%) participants who reported at least one

Table 1 Socio-demographic profile of the study participants in Gampaha District, Sri Lanka (*n* = 2046)

Category	Mirigama Medical Officer of Health area			Ragama Medical Officer of Health area			Total N (%)
	Female N (%)	Male N (%)	Total N (%)	Female N (%)	Male N (%)	Total N (%)	
Age groups (years)							
< 1	12 (1.9)	16 (2.8)	28 (2.3)	12 (2.5)	6 (1.7)	18 (2.1)	46 (2.2)
1 – < 5	43 (6.7)	48 (8.56)	91 (7.5)	32 (6.6)	37 (10.3)	69 (8.2)	160 (7.8)
5–17	132 (20.4)	132 (23.5)	264 (21.9)	78 (16.2)	85 (23.7)	163 (19.4)	427 (20.9)
18–59	378 (58.5)	312 (55.6)	690 (57.2)	274 (57.0)	173 (48.3)	447 (53.3)	1137 (55.6)
60–74	64 (9.9)	48 (8.5)	112 (9.3)	73 (15.2)	50 (14.0)	123 (14.7)	235 (11.5)
> 75	17 (2.6)	05 (0.9)	22 (1.8)	12 (2.5)	7 (2.0)	19 (2.3)	41 (2.0)
Educational level[a]							
Less than O/L[b]	251 (17.8)	210 (14.8)	461 (32.6)	165 (11.7)	129 (9.1)	294 (20.8)	755 (53.4)
More than O/L[b]	208 (14.7)	155 (11.0)	363 (25.7)	194 (13.7)	101 (7.1)	295 (20.8)	658 (46.6)
Employment status[a]							
Not employed	344 (24.3)	104 (7.4)	448 (31.7)	296 (20.9)	116 (8.2)	412 (29.1)	860 (60.9)
Employed	115 (8.1)	261 (18.5)	376 (26.6)	63 (4.4))	114 (8.1)	177 (12.5)	553 (39.1)
Income (in Sri Lankan Rupees)[a, c]							
No income	335 (23.7)	82 (5.8)	417 (29.5)	277 (19.6)	104 (7.4)	381 (27.0)	798 (56.5)
< 10,000	58 (4.1)	32 (2.2)	90 (6.3)	17 (1.2)	3 (0.2)	20 (1.4)	110 (7.8)
11,000 to 49,000	62 (4.4)	223 (15.8)	285 (20.2)	58 (4.1)	92 (6.5)	150 (10.6)	435 (30.8)
50,000 to 99,000	4 (0.3)	27 (1.9)	31 (2.2)	5 (0.3)	27 (1.9)	32 (2.2)	63 (4.4)
> 100,000	0 (0)	1 (0.1)	1 (0.1)	2 (0.1)	4 (0.3)	6 (0.4)	7 (0.5)
Smoking status[a]							
No	458 (32.4)	287 (20.3)	745 (52.7)	356 (25.2)	181 (12.8)	537 (38.0)	1282 (90.7)
Yes	1 (0.1)	78 (5.5)	79 (5.6)	3 (0.2)	49 (3.5)	52 (3.7)	131 (9.3)
Alcohol consumption[a]							
Not consuming	453 (32.1)	200 (14.1)	653 (46.2)	326 (23.1)	120 (8.5)	446 (31.6)	1099 (77.8)
Consuming	6 (0.4)	165 (11.7)	171 (12.1)	33 (2.3)	110 (7.8)	143 (10.1)	314 (22.2)

[a]Percentages are calculated using the total adult population > 18 years of age (*n* = 1413) as the denominator

[b]O/L refers to General Certificate of Education (ordinary level)

[c]At the time of the study 1 US dollar ≈ 180 Sri Lankan Rupees

symptom. The most frequently reported symptoms were phlegm (7.0%), leg pain (6.6%), cough (5.3%), back pain (5.0%), and headache (4.9%) (Table 2).

The top 20 symptoms accounted for 74% of symptoms reported; 30.4% were musculoskeletal-related, 25.5% were respiratory-related and 11.0% were gastrointestinal-related (Table 2).

Symptom reporting

From the participants who reported symptoms 58.5% ($n=1122$) were from Mirigama and 41.5% ($n=797$) were from Ragama (Table 3).

Of those who reported symptoms, 56% ($n=1075$) were females, 43.6% ($n=836$) were educated up to GCE O/L, 26.3% ($n=504$) were employed, and 24.4% ($n=469$) were having an income of less than Rs. 50,000. Of those reporting symptoms, 15.5% (297) were consuming alcohol and 6.2% (119) were smokers.

Healthcare seeking behaviour

924 (45.1%) out of 1919 who reported symptoms sought treatment from a healthcare institution. Another 153 (7.5%) ignored their symptoms and 560 (27.4%) self-treated. Interestingly, only 53 (2.6%) stated that they sought advice from a friend for their symptoms (Table 4).

Of the 924 who sought healthcare, 763 (82.6%) selected allopathic medicine, 88 (9.5%) Ayurveda treatment and 26 (2.8%) other forms of treatment such as Homeopathy. Of those who sought care, 35.7% ($n=330$) utilized public institutions, while 55.7% ($n=515$) went to private providers; some had used both public and private services.

46 (2.4% of all those who reported symptoms) were admitted to hospital, of whom, 42 were in public hospitals, including 19 to teaching hospitals; only 4 were admitted to private hospitals.

From those who had symptoms, children 1–5 years of age were the highest care seekers (66%) and 18–60-year age group had the least care-seeking behaviour of 43.1%. 50% ($n=538$) of females and 45.7% ($n=386$) of males sought care for their symptoms. Of those who sought care, 41.3% ($n=271$) were educated above GCE O/Ls, 41.3% ($n=208$) were employed and 38.6% ($n=22$) had an average household income of more than Rs.50,000 per month. Almost 32% of smokers and about 38% of persons who consume alcohol sought care (Table 3).

Factors associated with symptom reporting

Sex, having a chronic disease, distance to the nearest healthcare institution and occupation were significantly associated with symptom reporting on bivariate analysis. In the binary logistic regression, only consumption of alcohol was significantly predicting symptom reporting after controlling for other variables (Table 5).

Table 2 Ranking of the first 20 symptoms according to number of times each symptom was reported with ICPC 2 codes

Symptom (ICPC2[a] Code)	Mirigama Medical Officer of Health area N[b] (%)[c]	Ragama Medical Officer of Health area N[b] (%)[c]	Total (%) N[b] (%)[c]
1. Phlegm (R25)	2459 (4.1)	1741 (2.9)	4200 (7.0)
2. Leg pain (L14)	2158 (3.6)	1785 (3.0)	3943 (6.6)
3. Cough (R05)	1800(3.0)	1353 (2.3)	3153 (5.3)
4. Back pain (L02)	1756 (2.9)	1196 (2.1)	2952 (5.0)
5. Generalized body aches (A01)	1620 (2.7)	1276 (2.2)	2896 (4.9)
6. Headache (N01)	1598 (2.7)	1294 (2.2)	2892 (4.9)
7. Cold (R08.01[d])	1603 (2.7)	1163 (1.9)	2766 (4.6)
8. Sneezing (R07)	1410 (2.4)	1017 (1.7)	2427 (4.1)
9. Hand pain (L12)	1334(2.2)	1068 (1.8)	2402 (4.0)
10. Knee pain (L15)	1108 (1.9)	1240 (2.1)	2348 (4.0)
11. Tired (A04)	1136 (1.9)	650 (1.1)	1786 (3.0)
12. Numbness in hand (N05.01[d])	1001 (1.7)	573 (0.9)	1574 (2.6)
13. Shoulder pain (L08)	758 (1.3)	725 (1.2)	1483 (2.5)
14. Low back pain (L03)	924 (1.5)	554 (0.9)	1478 (2.4)
15. Ankle pain (L16)	661 (1.1)	750 (1.3)	1411 (2.4)
16. Throat pain (R21)	822 (1.4)	557 (0.9)	1379 (2.3)
17. Neck pain (L01)	767 (1.3)	584 (1.0)	1351 (2.3)
18. Numbness in legs (N05.02*)	720 (1.2)	598 (1.0)	1318 (2.2)
19. Belching (D08)	713 (1.2)	572 (1.0)	1285 (2.2)
20. Heartburn (D03)	571 (1.0)	450 (0.7)	1021 (1.7)

[a] ICPC2 refers to International Classification of Primary Care version 2R

[b] Total number of times, each symptom was reported during the study period

[c] Percentages are calculated using the total number of times all 55 symptoms were reported ($n=59,477$)

[d] 4th digit codes are specific to Sri Lanka

Table 3 Symptom reporting and healthcare seeking behaviour of study participants in Gampaha district, Sri Lanka

Variable	Mirigama Medical Officer of Health area		Ragama Medical Officer of Health area		Total	
	Reported symptoms N (%)[a]	Sought healthcare N (%)[b]	Reported symptoms N (%)[a]	Sought healthcare N (%)[b]	Reported symptoms N (%)[a]	Sought healthcare N (%)[b]
Overall	1122 (58.5)	593 (52.9)	797 (41.5)	331 (41.5)	1919 (100.0)	924 (48.1)
Age group (years)						
0–1	24 (1.2)	18 (75.0)	15 (0.7)	7 (46.7)	39 (2.0)	25 (64.1)
1–5	88 (4.6)	62 (70.4)	68 (3.5)	41 (60.3)	156 (8.1)	103 (66.0)
5–17	242 (12.6)	140 (57.8)	152 (7.9)	64 (42.1)	394 (20.5)	204 (51.8)
18–60	642 (33.4)	301 (46.9)	428 (22.3)	160 (37.4)	1070 (55.7)	461 (43.1)
60–65	105 (5.5)	59 (56.2)	117 (6.1)	54 (46.1)	222 (11.6)	113 (50.9)
>65	21 (1.1)	13 (61.9)	17 (0.9)	5 (29.4)	38 (2.0)	18 (47.4)
Sex						
Female	612 (31.9)	336 (54.9)	463(24.1)	202(43.6)	1075 (56.0)	538 (50.0)
Male	510 (26.6)	257 (50.4)	334 (17.4)	129 (38.6)	844 (44.0)	386 (45.7)
Educational level[c]						
Up to O/L[d]	548 (28.6)	298 (54.4)	288 (15.0)	125 (43.4)	836 (43.6)	423 (50.6)
More than O/L[d]	367 (19.1)	169 (40.1)	290 (15.1)	102 (35.2)	657 (34.2)	271 (41.3)
Employment status[c]						
Employed	337 (17.6)	145 (43.0)	167 (8.2)	63 (37.7)	504 (26.3)	208 (41.3)
Not employed	616 (32.1)	365 (59.3)	412 (21.5)	176 (42.7)	1028 (53.6)	277 (26.9)
Income (in Sri Lankan Rupees)[c, e]						
<50,000	322 (16.8)	140 (43.5)	147 (7.7)	62 (41.3)	469 (24.4)	202 (43.1)
>50,000	26 (1.3)	10 (38.5)	31 (1.6)	12 (38.7)	57 (3.0)	22 (38.6)
Smoking[c]						
Yes	69 (3.6)	24 (34.8)	50 (2.6)	14 (28.0)	119 (6.2)	38 (31.9)
No	934 (48.7)	504 (54.0)	581 (30.3)	249 (42.9)	1515 (78.9)	753 (49.7)
Alcohol[c]						
Consuming	160 (8.3)	65 (40.6)	137 (7.1)	49 (35.8)	297 (15.5)	114 (38.4)
Not consuming	842 (43.9)	464 (55.1)	498 (25.9)	215 (43.2)	1340 (69.8)	679 (50.7)

[a]percentage is calculated using total symptom episodes reported as the denominator (n = 1919)

[b]percentage is calculated using the number who reported symptoms as the denominator

[c]Percentages are calculated using the total adult population > 18 years of age (n = 1413) as the denominator

[d]O/L refers to General Certificate of Education (ordinary level)

[e]At the time of the study 1 US dollar ≈ 180 Sri Lankan Rupees

Factors associated with healthcare seeking behaviour

Area of residence (rural/urban), having a chronic disease, educational level, employment status, smoking and consumption of alcohol were significantly associated with healthcare seeking on bivariate analysis; none of the variables was significant in the multivariable analysis (Table 6).

Factors associated with choice of public or private healthcare institution

When adjusted for other variables, income was significantly associated with the decision to choose between a public or a private institution. Persons with higher incomes were more likely to choose a private institution (Odds ratio = 11.494 (95% CI: 1.336–98.922)) (Table 7).

Ecology of healthcare: symptom reporting and healthcare-seeking behaviour

In order to generate a profile of the ecology of healthcare in the Gampaha district, the estimates were adjusted to a population of 1000. Each box is part of the largest box representing a population of 1000 persons. During one month, 938 reported at least one symptom and 452 sought healthcare; 373 sought allopathic care and 43 used the Ayurveda system. 252 used private sector institutions and 161 used public sector institutions. Of the 23 admissions, nine were to tertiary care hospitals (Fig. 1).

Discussion

The study population had a high rate of symptom reporting ($n = 1919$; 93.8%). Phlegm (7.0%), leg pain (6.6%), cough (5.3%) backpain (5.0%) and headache (4.9%) were the five predominant symptoms. Among the 1919

Table 4 Ecology of healthcare: a summary

Category	Number (%)[a]
Total number of participants	2046 (100)
Reporting at least one symptom	1919 (93.8)
Action taken for symptoms	
Sought treatment	924 (45.1)
Ignored symptom	153 (7.5)
Self-treated	560 (27.4)
Advice from friend	53 (2.6)
Other	229 (11.2)
Treatment method[b]	
Allopathic	763 (37.3)
Ayurveda	88 (4.3)
Other	73 (3.6)
Type of allopathic treatment institution	
Public institution	330 (16.1)
Private institution	515 (25.2)
Both public and private institutions	32 (1.6)
Hospital admissions	
Public hospital	42 (2.0)
Teaching hospital	19 (0.9)
Private	04 (0.2)

[a]All percentages calculated using the total number of study participants (n = 2046) as the denominator

[b]Sum of percentages exceed 100% as some had sought treatment from both public and private allopathic institutions

who reported symptoms, 924(45.2%) sought treatment. Of those who sought treatment, the majority, 55.7% ($n = 515$) sought treatment from private institutions and 35.7% ($n = 330$) from a government facility. There were 46 admissions to hospitals and 42 were to government hospitals, of which 19 were to a teaching hospital. Sri Lankans have a high sensitization to illness and use the allopathic system to identify illnesses early and change providers if necessary, until a resolution of the illness [6].

From the total rural participants, 1122 reported symptoms and 593 (52.9%) sought care. In the urban sector, 797 reported symptoms and 331 (41.5%) sought care.

The reason for high symptom reporting in those who consume alcohol is unexplained.

Kroenke commenting on the two US studies [7, 8] stated that although more than 50% of people who present to healthcare institutions do so with symptoms, they represent only 25% of all the people who have symptoms in the community [12]. In our study, a higher percentage of 48% (924 of 1919) sought care. In the US and China, only 32% and 17% sought care when the symptom prevalence was 80% [8] and 29% [9], respectively. A contributing factor for the high symptom prevalence in our study may be the inclusion of children, who get priority in Sri Lanka [13, 14]. The US and Chinese studies included persons above 16 years.

Sri Lanka had outstanding healthcare indices even from the early 1940's such as an average life expectancy of 64 years, almost 10 years higher than the average for South Asia [15]. The tradition of providing state-sponsored healthcare dates to the era of Sri Lankan kings because of the influence of Buddhism. British occupation from 1796–1948 augmented this with the establishment of the hospital system and early universal suffrage. The British Labour Party policy of government direct spending on health and education may have been another contributing factor, implemented in the 1940's by the British and continued in the 1950's after independence [15].

Given that the majority (64.5%) of outpatients being females [16], we hypothesized that females have a high symptom reporting and healthcare-seeking behaviour. Males were less likely to report symptoms. However, sex did not affect the decision to seek care (females 50% ($n = 538$) and males 45.7% ($n = 386$). Jackson et.al exploring gender differences among patients in internal medicine settings conclude that there is no difference in

Table 5 Factors associated with symptom reporting in Gampaha district, Sri Lanka

Variable (reference)	Unadjusted		Adjusted for all variables in the model (Nagelkerke $R^2 = 0.082$)	
	Odds ratio (95% confidence interval)	*p*-value	Odds ratio (95% confidence interval)	*p*-value
Urban (Mirigama)	1.438 (0.982–2.104)	0.060	0.781 (0.299–2.037)	0.613
Sex (Male)	0.544 (0.378–0.784)	0.010	0.407 (0.148–1.118)	0.081
Age > 33 years	1.189 (0.829–1.706)	0.347	0.704 (0.260–1.907)	0.490
Having a chronic disease	2.01 (1.234–3.273)	0.005	1.182 (0.461–3.026)	0.728
Education (< O/L[a])	1.31 (0.869–1.973)	0.197	1.320 (0.554–3.146)	0.532
Distance (< 2 km)	0.418 (0.251–0.695)	0.001	0.740 (0.230–2.380)	0.613
Employment status (unemployed)	0.657 (0.444–0.973)	0.036	0.844 (0.168–4.240)	0.837
Income (< 50,000 Sri Lanka Rupees[b])	1.367 (0.474–3.942)	0.563	1.630 (0.335–7.922)	0.545
Smoking (not smoking)	0.598 (0.326–1.098)	0.097	0.502 (0.162–1.552)	0.231
Consuming alcohol	0.927 (0.572–1.501)	0.757	5.288 (1.738–16.094)	0.003

[a]O/L refers to General Certificate of Education (ordinary level)

[b]At the time of the study 1 US dollar ≈ 180 Sri Lankan Rupees

Table 6 Factors associated with healthcare seeking behaviour in Gampaha district, Sri Lanka

Variable (Reference)	Unadjusted		Adjusted for all variables in the model (Nagelkerke $R^2 = 0.047$)	
	Odds ratio (95% confidence interval)	*p*-value	Odds ratio (95% confidence interval)	*p*-value
Urban (Mirigama)	0.634 (0.528–0.761)	0.0001	0.884 (0.531–1.470)	0.634
Male	0.841 (0.702–1.008	0.061	0.773 (0.434–1.377)	0.382
Age > 33	0.878 (0.734–1.051)	0.156	1.357 (0.790–2.329)	0.268
Chronic disease (Not having a chronic disease)	1.269 (1.038–1.552)	0.020	1.237 (0.754–2.029)	0.400
Education (< G.C.E. O/L[a])	0.685 (0.558–0.842)	< 0.001	0.812 (0.501–1.315)	0.397
Employment status (unemployed)	0.655 (0.528–0.813	0.0001	0.621 (0.263–1.465)	0.276
Distance (< 2 km)	0.991 (0.717–1.37)	0.958	0.627 (0.308–1.277)	0.198
Income (< 50,000 Sri Lanka Rupees[b])	0.831 (0.473–1.46)	0.519	1.044 (0.503–2.165)	0.909
Smoking	0.475 (0.319–0.707)	0.0001	0.769 (0.400–1.480)	0.432
Consuming alcohol	0.606 (0.469–0.784)	0.0001	0.751 (0.420–1.345)	0.336

[a]O/L refers to General Certificate of Education (ordinary level)

[b]At the time of the study 1 US dollar ≈ 180 Sri Lankan Rupees

Table 7 Factors associated with choosing a public or private institution for healthcare in Gampaha district, Sri Lanka

Variable (Reference)	Unadjusted		Adjusted for all variables in the model (Nagelkerke $R^b = 0.145$)	
	Odds ratio (95% confidence interval)	*p*-value	Odds ratio (95% confidence interval)	*p*-value
Rural (Mirigama)	0.862 (0.645–1.152)	0.317	0.444 (0.188–1.053)	0.065
Male	0.908 (0.686–1.202	0.501	1.095 (0.416–2.883)	0.854
Age > 33	0.612 (0.463–0.808)	0.001	0.635 (0240–1.679)	0.360
Chronic disease (Not having a chronic disease)	0.694 (0.514–0.935)	0.017	0.615 (0.267–1.414)	0.252
Education (< G.C.E. O/L[a])	1.133 (0.817–1.570)	0.455	1.168 (0.520–2.626)	0.706
Employment status (Unemployed)	0.743 (0.527–1.047)	0.090	0.752 (0.210–2.688)	0.661
Distance (< 2 km)	1.503 (0.875–2.582)	0.140	1.273 (0.369–4.388)	0.703
Income (< 50,000 Sri Lanka Rupees[b])	4.330 (1.220–15.373)	0.023	11.494 (1.336–98.922)	0.026
Smoking	0.484 (0.242–0.970)	0.041	0.923 (0.280–3.046)	0.896
Consuming alcohol	0.577 (0.377–0.884)	0.011	1.089 (0.40–2.966)	0.868

[a]O/L refers to General Certificate of Education (ordinary level)

[b]At the time of the study 1 US dollar ≈ 180 Sri Lankan Rupees

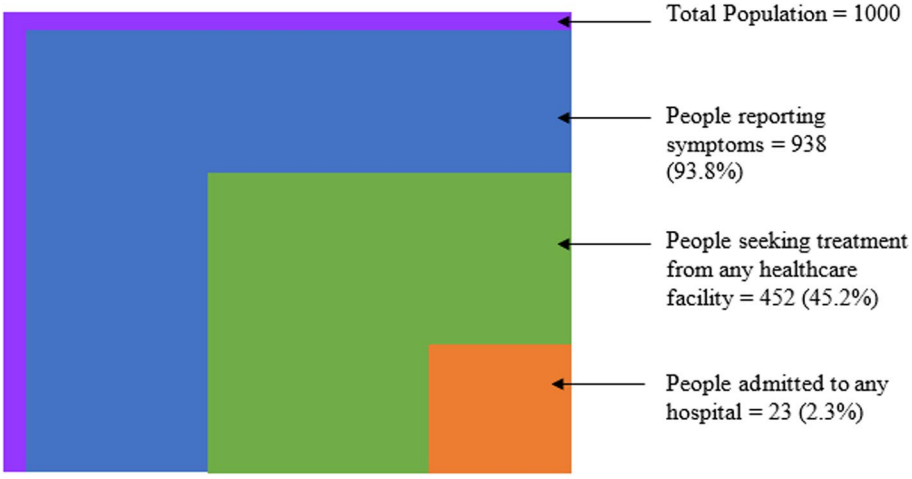

Fig. 1 Ecology of healthcare in Gampaha District Sri Lanka for one month for 1000 population. Figure legend: Each box represents a subgroup of the largest box which comprises 1000 people of all ages

utilizing healthcare services among men and women who had symptoms [17]. However, universally in primary care morbidity studies, females have more visits than males [16, 18, 19].

A key finding of our study was that the majority (55.7%) sought care from private healthcare services despite free healthcare services being available in the public sector. Although the Ministry of Health acknowledges that private and public sectors have an equal share of outpatients, the methodology for this estimate is not clear [5]. Russell (1997), who studied two poor communities in the Colombo area, reported that for acute problems, people will seek care from the private sector, but for chronic illnesses, they sought care from the public sector [13]. Our study looked at the symptoms in detail but the diagnoses could not be accurately verified because of the lack of medical records in both private and public sectors.

Income was associated with the decision to seek care in a public or private institution. The affluent were less likely to seek care from public institutions. With increasing income, people seek services paying a higher fee, thinking that they receive better quality care for which they may enjoy better interpersonal communication and shorter waiting times [20]. Rannan-Eliya et.al reported that quality of outpatient care in public and private sectors in Sri Lanka is generally high for a lower-middle-income country [21]. They state that 'public and private sectors perform similarly, except that private sector patients have longer consultations, are more likely to receive education and advice, and obtain better interpersonal satisfaction' [21].

Even with a high symptom prevalence (93%), hospital admissions were reported by only 2.9%, which is similar to findings from previous Sri Lankan morbidity studies [20]. This raises the question whether the high number of OPD visits is warranted and demonstrates the efficient filtering mechanism by the OPD doctors.

Compared US studies [7, 8], with 9 admissions per 1000 persons to hospitals during a one-month period, our study had 23 admissions per 1000 persons. However, none of the sociodemographic factors we studied explained hospital admissions. High rates of admissions may be due to the decision to admit taken by the attending doctor, (a) with minimal or no medical records to provide quality follow-up care and (b) giving priority to patient safety.

Ayurveda has existed for 5000 years [22] and Sri Lanka's own indigenous healthcare systems was present before British rule in 1815. In our study, only 4.3% (n = 88) visited Ayurveda hospitals. In comparison, in the Chinese study, 7.3% visited a traditional Chinese medical practitioner. The relatively few visits to Ayurveda hospitals in our study may be due to the strong impact of the allopathic system.

A point for discussion is why Sri Lanka cannot project the findings from studies by White et al. and Green et al. [7, 8]. Our culture of state-sponsored free healthcare is a long one that precedes even British rule, that is different to that of the US. In addition, the above-mentioned studies used data from medical records, the survey of sickness in England and Wales, United States National Health Survey, Medical Expenditure Panel Survey – 1996 and several diary studies done during the period for their ecology graph. However, since we do not have primary care medical records or reliable data, we designed this study specially to collect accurate and reliable data from the grassroot level. By selecting the second most populous district in the country where all types of health facilities are available for the people, we have tried to make this a generalizable study.

Limitations

Nearly 13% of invitees declined to complete the diary. Gampaha district, although the second most populous district, may not be representative of the Sri Lankan population, especially because of the low or almost negligible representation of the plantation sector.

Sri Lanka does not have four distinct seasons, but a wet and dry season. However, it has been reported that the number of outpatient visits are less from July to September [2]. The southwest monsoon which affects the Gampaha district, extends from May to September; as the survey was conducted during this period, it is likely that symptom reporting may have been affected, biasing the results in a positive way as childhood infections are higher during this period.

Due to the lack of medical records in the public and private sectors, we were unable to validate the reported visits of our participants. This has been recognized as a major drawback of healthcare system in the country which has been prioritised for action.

We categorized the income information because the people are reluctant to divulge their income due to the fear of losing government welfare assistance. The Rs 50,000 cutoff was taken because it is closer to the median income in the 2016 household income and expenditure survey [23]. As only 13.7% of Sri Lankans were covered by a life insurance in 2016 [24], we did not include insurance-related questions in the survey. However, health insurance is a major factor that determines admission to private institutions.

The reliability of our results depends on how accurately the participants recorded the information. It is possible that while some overreported their symptoms, others may have underreported them. It is also likely that some may not have filled the diary daily as instructed but may have done so towards the end of the week just before the weekly collection of the data sheets; hence, there may

have been some recall bias. Households were frequently contacted by research assistants and reminded to fill out the data collection forms to ensure no missing values and timely data entry.

There was a wide range of private health care practitioners and institutions from low-cost private practices to high-cost private hospitals for the participants to choose from. In addition, visiting a healthcare provider at the convenience of the participant and the travel taken to visit a public healthcare institution and related costs are also likely to have affected their choice which may be reflected in our results. Unfortunately, we did not collect such information.

The model used to identify factors associated with choice of a healthcare institution was able to explain only about 14.5% of its variability; the odds ratio for income had a wide confidence interval suggesting the presence of potential confounding with other variables. The relatively small Nagelkerke R^2 indicates that there are possibly other variables that are associated with the choice of a healthcare provider.

Conclusions

The population of the Gampaha district has a high symptom prevalence (93.8%) over a 4-week period. Phlegm (7.0%), leg pain (6.6%) and cough (5.3%) were top-ranking symptoms, while musculoskeletal and respiratory systems comprised more than 50% of reported symptoms.

The population had a high health care seeking behaviour (45.2%). The private sector was the preferred choice (55.7%) for ambulatory care although healthcare is free for all citizens in the public sector. However, for inpatient care 90% sought admission in public hospitals.

Provision of ambulatory care services should be prioritized in further development of the health services.

Abbreviations

CNTH	Colombo North Teaching Hospital
EPI	Expanded Programme of Immunization
ERC	Ethics Review Committee
GCE O/L	General Certificate of Education Ordinary Level
GDP	Gross Domestic Product
ICPC	International Classification of Primary Care
MOH	Medical Officer of Health
OPD	Out Patients' Department
PHM	Public Health Midwife
SPSS	Statistical Package for the Social Sciences
USA	United States of America

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-025-13337-w.

Supplementary Material 1.

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Clinical trial number

Not applicable.

Authors' contributions

SSW, KM, SN and ARW conceptualised and conducted the study. UPL developed databases and online data entry platforms and analysed data. SSW, KM, SN, UPL and ARW contributed to data analysis, manuscript writing and revision. SN secured funding. All authors read and approved the final version of the manuscript.

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Data availability

The data are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The study adhered to the Declaration of Helsinki and ethics clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Kelaniya, Sri Lanka (ERC number – P/273/11/2017). Before inviting the participants, an information sheet was given, and written consent was obtained. When there were minors (12–17 years), informed consent from parents or guardians were obtained before proceeding with data collection. All the participants were given the chance to withdraw from the study at any time.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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