Health impact assessment of the Health Stations Program in Buenos Aires, Argentina*

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ABSTRACT

Objective.   *To explore the motivations and expectations of users of the Health Stations Program in the Autonomous City of Buenos Aires and to evaluate its potential health impact.*
Methods.   *In-depth interviews were conducted (n = 34) and a self-administered survey was sent to users of the program (n = 605). An epidemiological model was developed to estimate the impact of the program on cardiovascular events (CVE) and disability-adjusted life years (DALYs).*
Results.   *The main motivating factors for using the health stations were accessibility, affordability (free services), and satisfaction with the care received. Overall, 14.4% (95% CI, 10.3-18.5%) of hypertensive users and 24.8% (95% CI, 17.6-32.0%) of diabetic users reported having learned of their abnormal levels at a health station. More than half of the respondents reported some improvement in their knowledge about the benefits of physical activity and healthy eating. This was more frequent among younger users, those with less education, public health system users, users of a health stations in the southern zone of the city, and those with a cardiometabolic risk factor (p<0.05). It was estimated that the health stations would prevent 12.5 cardiovascular and cerebrovascular events per year in the beneficiary population (4.75 events/100,000) and 47.75 DALYs due to these causes.*
Conclusions.   *Health stations are a favorable space for the implementation of health promotion and prevention actions, contributing to the detection of risk factors and facilitating their monitoring, with potential to prevent cardiovascular events and their consequences.*

Keywords   Health promotion; primary prevention; healthy lifestyle; health knowledge; attitudes, practice; cardiovascular diseases; health evaluation; Argentina.

Noncommunicable diseases (NCD) are the main cause of mortality worldwide, responsible for 71% of all deaths (1). In Argentina, they account for 81% of deaths and, moreover, are the leading cause of disability, cardiovascular diseases being the most common (2, 3). Their known modifiable risk factors are related to lifestyle (4). Highly prevalent in the Argentine population, these risk factors are associated with an advanced stage of nutritional transition and an

environment that fosters obesogenic behaviors and NCDs (5). To illustrate, at least 25% of adults smoke, 55% have a low level of physical activity, fruit and vegetable consumption is only 1.9 portions/day, 58% are overweight, 34% suffer from hypertension, and 10% from diabetes (6). In the face of this growing epidemic, government has a fundamental responsibility in the development of a response, which should include such strategies as health promotion, primary prevention, the inclusion of health in all policies, and universal health coverage (7, 8).

In 2012, the Government of the Autonomous City of Buenos Aires launched the Health Stations Program (*Programa Estaciones Saludables*), which consists of health stations strategically positioned on public thoroughfares with free and open access to people moving about the city. The services offered by all health stations include blood pressure (BP), blood glucose, weight, and height measurement. Some stations offer nutritional counseling by a university-educated nutritionist trained in the technique (9). They also offer talks and workshops on healthy eating, counseling on physical activity, dance and exercise classes for adults, and *juegotecas* (recreational areas with active games for children) (9, 10). Buenos Aires currently has 40 health stations in different parts of the city. Some are open daily day in parks and other strategic locations (permanent and temporary health stations); others offer services in different locations on specific days and schedules (mobile health stations); and still others are located at transfer points in the city's subway system (underground health stations).

Evaluating this type of government intervention requires information about the activities and their outcomes in order to make suggestions to boost their effectiveness, and recommendations for future initiatives (11). The objective of this study was to identify users' motivations, expectations, and perceptions of the stations' impact and estimate the program's potential health impact in terms of reducing cardiovascular disease.

MATERIALS AND METHODS

In 2015, a cross-sectional qualitative and quantitative study was conducted that included in-depth interviews and a survey to learn users' motivations, expectations, and perception of the stations' impact and develop an epidemiological model for estimate the potential impact on the health of the population.

Qualitative and quantitative study

a) In-depth interviews: Participant selection was based on convenience, seeking a representative sample of the different user perspectives, considering sex, age, type of health stations (underground/mobile/temporary/permanent), and area of the city (center/north/south). Wide disparities in socioeconomic and demographic indicators are observed between areas, especially between the north and the south, which has the highest percentage of structurally poor and income-poor households (12). For the interviews, the investigators contacted users in the stations, explained the objective of the study, and invited them to participate.

The interview script prepared by the research group was validated by local researchers for the language and phrasing of the questions. It was enriched with data from two focus groups in which the motivations, expectations, and impact on users were identified from the perspective of health station organizers and service providers (nursing and nutrition staff). The topics addressed in the interview were: users' motivations for visiting the health stations and their expectations, the impact of the service received on their health care expenditure; improvements in health, use of the health system, and influence on behavioral changes. Data processing included transcription of the interviews, data processing with Atlas-ti 6.2 software (Scientific Software Development GmbH, Berlin, Germany), and thematic analysis by study dimension using grounded theory (13).

The interview findings, which served as input for the preparation of the survey, included emerging issues and served to guide the vocabulary and phrasing of the questions.

b) Self-administered survey: Men and women over the age of 18 who used the stations were included. The survey was conducted in stations selected through stratified random sampling with eight strata, combining the types of center and area of the city. The number of users per stratum was calculated proportionally to the number of services provided in 2014. Then, all visitors to the selected stations were invited to take an anonymous survey and deposit it in a box.

The survey consisted of 31 structured questions on sociodemographic characteristics and history of chronic disease, as well as the aspects studied and emerging from the qualitative phase: utilization of the health stations; information about lifestyles; perceived impact on health; lifestyles and costs related to blood pressure and blood glucose monitoring. The results are shown as relative frequencies and 95% confidence intervals (CI95%). Analyses were performed by subgroups of age; sex; level of education; place of residence; health coverage; time and regularity of visits to the stations; presence of cardiovascular risk factors; type of center, and geographical area. The Chi-square test was used for comparisons between groups, considering an alpha error of 0.05 acceptable. The data were analyzed with Stata/SE 12.0 for Windows© (2011) (StataCorp LP, College Station, TX, United States).

Health impact model

The expected outcomes following the interventions provided in the health stations can be classified as initial, intermediate, and final (14). The first outcomes (knowledge about healthy lifestyles, detection of people with hypertension and diabetes, improvements in lifestyle and in the control of other cardiometabolic risk factors [CMRF]) were basically described through the survey mentioned above. The model focused on estimating the final outcomes, as indicated below.

The principles of good practice for the development of health care decision models were followed (15). An epidemiological model programmed in Stata/SE 12.0 was used to predict the estimated impact of the health stations on fatal and nonfatal cardiovascular events (heart attack and stroke) and disability-adjusted life years (DALY), based on the expected modifications in risk factors attributable to the stations. A detailed description of the model is available from the authors on request. Its application and calibration to evaluate food policies in Argentina has already been published by our group (16).

Two scenarios were constructed to estimate the impact of the health stations–one without the intervention (without health stations), and the other with it (with health stations, the current scenario), and the difference in CVDs and DALYs between them was calculated. The first scenario consisted of a population identical to the one that visited the stations in 2014 but without considering their effectiveness of the stations in 2014 by age, sex, and the presence of risk factors. The expected change in risk factors in the user population attributable to the health stations in 2014 was then calculated (BP, Body Mass Index [BMI], smoking, treatment for hypertension). The simplified Framingham Equation (17) was used to predict the reduction in the relative risk of CVD with modification of the risk factors. The methodology of the Global Burden of Disease Study (18) was used to calculate the DALYs avoided. DALYs consist of the years of life lost due to premature mortality (DALYPM) and the years of life with disability (YLD). The DALYPMs were calculated using life expectancy in Argentina and deaths according to the national health statistics for 2010 (19), and YLDs were estimated using the disability weights of DisMos II (20). To estimate the present value of effects in the future, future years and disability were discounted at an annual rate of 5% (21).

Information sources: The main parameters were obtained from the health stations program benefits database for 2014, Argentina's vital statistics (19), case-fatality data (22–25), data from the CESCAS I study (population study for the detection and monitoring of cardiovascular risk and disease in adults in cities of Argentina, Chile, and Uruguay) (26), and data on the effectiveness of the interventions carried out in the health stations (27–31) (Table 1). The missing values on smoking and BMI were imputed using

TABLE 1. Parameters and sources of information for populating the epidemiological model, Argentina, 2014

Data requested, by section of the model	Parameters	Source
For estimating expected events in the target population. Scenario without Health Stations.		
Distribution of health stations users >30 years, by age and sex		Health stations database, 2014
Expected fatal cardiovascular events in the population without health stations, by age and sex	W: 270 M: 437	(20, 22)
Case-fatality from acute myocardial infarction (AMI) and acute coronary syndrome (ACS), by sex	W: 0.38 M: 0.44	(22)
Projected AMI and ACS case-fatality, by age and sex	Age and sex	Authors, using the Hospital Discharge Database (20)
Expected nonfatal cardiovascular events in the population without health stations	W: 1 134 M: 1 596	Authors
For calculating the baseline risk at 10 years using the Framingham Risk Equation in the population. Scenario without health stations.		
Simplified risk equation (variables: sex, age, systolic blood pressure (SBP), treatment for hypertension, current smoker, diabetes, Body Mass Index (BMI))		(15)
Data entered:		Health stations database 2014
Age and sex	Individual data	Health stations database 2014[a]
Systolic blood pressure	Individual data	Health stations database 2014, missing values (30)
Smoking	Individual data	Database of IS 2014, missing values: (5)
BMI	Individual data	Database of IS 2014
Presence of diabetes	Individual data	
Expected change in SBP, BMI, smoking habits, and treatment for hypertension following interventions in health stations		
Estimated change in SBP (mmHg)		
Low-intensity nutritional counseling[b] (general population)	-1.2 (CI95%-3.3; 1.0)	(25)
Moderate-intensity nutritional counseling[c] (subjects without hypertension)	-0.5 (CI95%-1.8; 0.8)	(25)
High-intensity nutritional counseling[d] (subjects without hypertension)	-1.5 (CI95%-2.1; -0.9)	(25)
High/moderate-intensity nutritional counseling (subjects with hypertension)	-2.03 (CI95%-2.91; -1.15)	(26)
Regular blood pressure monitoring (subjects with hypertension)	-2.50 (CI95%-3.70; 1.30)	(27)
Change in treatment for hypertension		
Knowledge of hypertension in the initial and subsequent consultations	Individual data	health stations Database 2014
Probability of receiving treatment if hypertension is known	By age and sex	(24)
Estimated change in BMI (kg/m²)		
Low-intensity nutritional counseling	-0.10 (CI95% 0.22; 0.02)	(25)
Moderate-intensity nutritional counseling	-0.14 (CI95%-0.27; -0.01)	(25)
High-intensity nutritional counseling	-0.48 (CI95%-0.64; -0.32)	(25)
Estimated change in smoking		
Expected baseline smoking cessation (%)	2	(28)
Relative risk with respect to smoking cessation after brief counseling	1, 2	(29)

Source: Authors.
W, women; M, men; CI95%, 95% confidence interval; AMI, acute myocardial infarction; ACS, acute coronary syndrome; BMI, Body Mass Index; SBP, systolic blood pressure.
[a] For missing values, a random imputation was performed with average data by age and sex from individuals who had data.
[b] 1-2 sessions in 2014 (< 30 minutes).
[c] 3-24 sessions in 2014 (30-360 minutes).
[d] More than 24 sessions in 2014 (> 360 minutes).

the population estimates from the Tobacco Survey (32) and the Third National Survey of Argentine Risk Factors (6).

The study was approved by the Research Protocol Ethics Committee of the Hospital Italiano de Buenos Aires. All focus group and interview participants gave their written informed consent, and anonymity was guaranteed. The self-administered survey was anonymous and voluntary.

RESULTS

Motivations, expectations, and impact from the users' perspective

In-depth interviews: 34 health stations users were interviewed. Table 2 presents the findings. The main drivers of the demand for and use of health stations were geographical access, easy access to free services, and satisfaction with the services received.

Self-administered survey: the responses of 605 adult health stations users, whose characteristics are displayed in Table 3, were included.

Transportation costs: for 80% of the users, visiting the health stations did not involve additional transportation costs, since the stations were on the way to their activities or they got around on foot or by bicycle.

Detection: 14.4% (CI95% 10.3-18.5%) of the users with hypertension and 24.8% (CI95% 17.6-32.0%) of those with diabetes reported having learned at a health station that they had high blood pressure or high blood glucose.

Blood pressure monitoring: 88.4% of the respondents reported having checked their blood pressure more than once a month in different locations during the past three months, and 78% (CI95% 74.7-81.3%) had done so at a health station. Prior to their initial visit to a health station, 60.5% (CI95% 56.1-65.0%) of the respondents had paid to have their blood pressure taken. Some 97.2% (CI95% 95.2-99.1%) of the people with hypertension surveyed reported periodically checking

their blood pressure. Prior to visiting a health station, 42.5% (CI95% 36.5-48.6%) had not periodically checked their pressure.

Blood glucose monitoring: 86.5% (CI95% 80.8-92.2%) of diabetic users reported checking their blood glucose at least once a week during the past three months, and 76.6% (CI95% 69.5-83.7%) reported having this done at a health station. Before visiting the station, 52.5% (CI95% 43.5-61.5%) of the diabetic users surveyed had not periodically checked their blood glucose, and 71.4% (CI95% 67.8-75.0%) had had to pay to have it done.

Perception of learning about healthy habits (Table 4): younger users (p = 0.008) and those with some CMRF (p = 0.048) more frequently reported having learned something new about the benefits of physical activity. Furthermore, younger people (p = 0.048), people with a lower level of education (p < 0.001), users of the public health system (p = 0.03), and people with some CMRF (p = 0.001 reported

TABLE 2. Findings from in-depth interviews of health station users. Autonomous City of Buenos Aires, Argentina, 2015

Dimensions	Emerging issues	Verbatim statements
Motivation for visiting the health station	Motivation for first visit: Access: Location in places on the way to daily activities - people who visit out of curiosity without intending to receive a specific service - people invited in by health station staff Desire for a health check-up (healthy people and people with known chronic diseases) - savings in the cost of checking blood glucose in people with diabetes - periodic blood pressure monitoring - weight monitoring and consultation with a nutritionist - free exercise classes in green spaces Motivation to continue coming: - proximity and convenience - free periodic blood pressure and blood glucose monitoring - nutritional counseling - satisfaction with the services	*"Well … I was passing by and saw it, and came in, just as I did now … (Woman, aged 68, Mobile Center)* *… one of my friends and I were passing by and we saw the health station, so we said we wanted to check our blood pressure and went in" (Woman, aged 41, Permanent Center)* *"He said they checked for diabetes and took blood pressure, so I took advantage of the opportunity to do it …" (Woman, aged 58, Mobile Center)* *"… knowing how much I weighed when I weighed myself at the pharmacy, and it's completely different. I said: well, I going to get weighed there since it may very well be different and [the scale] is calibrated..." (Man, aged 59, Permanent Center)*
Expectations and care received	- Some users do not have clear expectations: health stations are a novel system; they are no substitute for other types of care but provide complementary health promotion services. Patients with chronic diseases come in for free and accessible regular check-ups that complement their medical care.	*"Since I'm from the neighborhood, I happened by here and saw they were taking people's pressure, which interested me. And afterwards, I must say, the girls treated me really well, here and at any other center in the city that I go to." (Woman, aged 76, Mobile Center) "Last minute information: If you go to a [health service] waiting room, you have to get there early. Here, however, you wait just a little (…) and get to work only about five minutes late" (Woman, aged 57, Permanent Center)* *"… if a person comes and pays attention, it's like prevention. (…) It can serve as prevention for many people, but not as a medicine or treatment…" (Woman, aged 57, Permanent Center).* *"The nutritionist here is a marvelous human being; she explains things in great detail; she helps you change, and if you don't lose weight, she substitutes one thing for another … others won't tell you. I really can't complain. (Man, aged 59, Mobile Center).*
Impact on health, lifestyles and individual costs to users.	- Ability to detect cardiovascular disease or risk - Facilitator for periodic monitoring of blood glucose and blood pressure; - Cost savings in monitoring	*It forces to you to check it …that is, before, going to a pharmacy was too much trouble; here it's faster, they give you good service, and your questions are cleared up more quickly. (Woman, aged 56, Mobile Center)*

Source: Authors, based on the results presented.

TABLE 3. Sociodemographic characteristics, visits to the health stations, and risk factors of respondents (health station users) (n = 605), Autonomous City of Buenos Aires, June 2015

Characteristic	No.	%
Sex		
Female	295	48.8
Male	295	48.8
Other	2	0.33
DK/NR	13	2.2
Age (years)		
18-39	85	14.4
40-59	165	27.3
60 or over	309	51.2
DK/NR	43	7.1
Level of education		
Never attended school	12	2.0
Complete or incomplete primary	120	19.9
Incomplete or complete secondary/tertiary	249	41.2
Incomplete or complete university/tertiary	204	33.7
DK/NR	20	3.3
Place of residence		
City of Buenos Aires	434	71.7
Province of Buenos Aires	98	16.2
Other	12	2.0
DK/NR	61	10.1
Health coverage		
Public system	116	19.2
Obras sociales	288	47.6
Prepayment	101	16.7
DK/NR	100	16.5
Hypertension (self-reported)	284	46.9
Diabetes (self-reported)	139	23.3
Overweight (self-reported)	234	38.7
Type of center		
Underground	60	9.9
Mobile	117	19.3
Intermediate	186	30.7
Permanent	242	40.0
Geographical location of the health station		
South	152	25.1
Center	382	63.1
North	71	11.7
Number of times user visited the center		
First time	48	8.0
2-5 times	134	22.2
> 5 times	413	68.2
DK/NR	10	1.7

Source: Authors, based on the results presented.
DK/NR: Does not know/No response.

having learned something new about how to start engaging in or increase their physical activity.

The percentage of users who reported having learned something new at the health stations about the importance of healthy eating and what to eat to stay healthy was somewhat higher among younger people (p < 0,001), people with a lower level of education (p < 0.001), users of the public health system (p = 0.033), people who visited stations in the south of the city (p < 0.001), and users with CMRF (p = 0.033 and p = 0.004, respectively). There were no differences among the subgroups analyzed with regard to having received some type of information about the importance of quitting smoking. The percentage of smokers who reported knowing strategies to quit smoking after visiting a health station was somewhat higher among users of the public health system and *obras sociales* (p = 0.013) and people in the south of the city (p = 0.014).

Perception of changes in habits (Table 4): the percentage of respondents who reported engaging in more PA after visiting the health stations was higher in women (p = 0.013), younger people (p < 0,001), people with a higher level of education (p = 0.011), and those who visited permanent and temporary stations, especially in the north of the city. The percentage of users who reported eating more fruits and vegetables was higher in the younger group (p < 0.001). The percentage of users who reported using less salt in their diet was higher in those with a primary education (p < 0.001), people with diabetes (p = 0.04), people with hypertension (p < 0.001), and users of the public health system and *obras sociales* (p = 0.002).

Estimation of the health impact

According to the service database, in 2014, 286,478 people received nursing services (which include blood pressure, blood glucose, and weight monitoring and/or health promotion activities). Some 71% of the people who visited a health station for this reason in 2014 did so only once; 22%, 2-5 times; and the remaining 7%, more than five times. It was estimated that in 2014, the program detected 4,394 new cases of hypertension and 2,108 new cases of elevated blood glucose.

During the same period, 71,684 people received nutritional counseling. A full 90.6% of these interventions were classified as low-intensity (1-2 sessions in 2014, <30 minutes), 9.2% as moderate-intensity (3-24 sessions in 2014, 30-360 minutes) and the remaining 0.2% as high-intensity (more than 24 sessions in 2014, >360 minutes). Some 78.3% of those who received nutritional counseling used at least one nursing service at least once.

With regard to CVD, if there were no health stations (counterfactual scenario), the population of 262,242 users would suffer 707 fatal events (women: 270; men 437) and 2,730 non-fatal events (women: 1,134; men 1,596) during the year.

Events avoided thanks to the health stations are estimated at 12.46 (CI95% 12.30-12.66), and 124.64 (123.01-126.63) in 10 years. This means avoidance of 47.75 DALYs (CI95% 47.25-48.25) and 477.49 (472.51-482.46) events in 10 years. Table 5 presents more details on the estimated impact in terms of the expected reduction in fatal and nonfatal cardiovascular events and DALYs.

DISCUSSION

The different factors that act as drivers of demand and use of health stations were identified using a qualitative and quantitative approach. The stations' strategic location in places where potential users are likely to pass by arouses their interest and curiosity, causing them to enter, and facilitates their use of the services. Then, satisfaction with the services received, geographic accessibility, and free care serve as motivation for repeat visits. The inquiry into user's expectations vis-à-vis their experiences with the services received shows no gap between what they expected and what they received, contributing to a high degree of satisfaction with the services.

Known benefits include periodic blood pressure and blood glucose monitoring in order to treat hypertension and diabetes (29.33). Users stressed that the health stations facilitate routine blood pressure and blood glucose measurement, since they are geographically very accessible. They also stressed the fact that the services are free and that they considered the cost of these services outside the health stations to be a barrier. The health stations were therefore able to help them reduce gaps in health. One of the main findings of this study on the impact on the health of the population is the stations' contribution to the detection of people who were unaware they had hypertension or diabetes. Moreover, the program facilitated periodic blood pressure and blood glucose monitoring in the chronically ill, some of whom did not have this done prior to visiting the stations.

Health promotion is a strategy for achieving equity, democracy, and social justice (34, 35). It improves people's quality of life and increases their well-being by encouraging them to accept responsibility for maintaining and monitoring their own health (36, 37). The results of this study show that some users report that, since visiting a health station, they have learned something new about the benefits of physical activity or what to do to increase it, and/or something about healthy eating. It is interesting to note that the groups that most frequently reported having learned something new at the health stations are younger people, people with a lower level of education,

TABLE 4. Perception of learning about lifestyles and changes in habits: survey of health station users (n = 605), Autonomous City of Buenos Aires, Argentina, 2015

Dimensions	No.	% (CI95%)
Perceived learning at a health station		
Learned something new about the benefits of physical activity (PA)	370	61.2 (57.2;65.1)
Learned what to do to begin or increase PA	242	40.0 (36.1; 43.9)
Learned something new about the importance of healthy eating	361	59.7 (55.7; 63.6)
Learned what to eat to stay healthy	287	47.4 (43.4; 51.4)
Received information about the importance of quitting smoking	257	42.5 (38.5; 46.4)
Learned strategies to quit smoking[a]	125	20.6 (14.4; 26.7)
Perceived changes in habits after visiting a health station		
Does more PA	266	44.0 (39.9; 48.1)
Does less PA	2	0.33 (01.1; 03.6)
Eats more fruits and vegetables	328	54.2 (50.1; 58.4)
Eats fewer fruits and vegetables	8	1.25 (0.3; 02.2)
Uses less salt	310	51.3 (47.2; 55.5)
Uses more salt	26	4.3 (02.6; 6.0)
Lost or maintained weight[b]	408	67.4 (61.2; 73.7)
Quit smoking[a]	146	24.1 (18.5; 29.8)

Source: Authors, based on the results presented. CI95%, 95% confidence interval; PA, physical activity.
[a] Smokers on initial visit.
[b] Overweight/obesity on initial visit.

TABLE 5. Fatal and non-fatal events and DALYs avoided per year associated with the Health Stations Program Health, Autonomous City of Buenos Aires, Argentina, 2014

Results	2014	2014	Cumulative 10 years
	Number of events (CI95%)	Rates cases/100 000[a] (CI95%)	Number of events (CI95%)
Total events avoided	-12.46 (-12.30; -12.66)	-4.75 (-4.69; -4.83)	-124.64 (-123.01; -126.63)
Fatal	-2.44 (-2.41; -2.48)	-0.93 (-0.92; -0.95)	-24.41 (-24.06; -24.83)
Death from AMI	-1.08 (-1.06; -1.10)	-0.41 (-0.41; -0.42)	-10.78 (-10.63; -10.97)
Death from ACS	-0.32 (-0.31; -0.32)	-0.12 (-0.12; -0.12)	-3.17 (-3.13; -3.23)
Sudden death	-0.09 (-0.09; -0.09)	-0.03 (-0.03; -0.04)	-0.91 (-0.89; -0.92)
Death from CVA	-0.95 (-0.94; -0.97)	-0.36 (-0.36; -0.37)	-9.55 (-9.42; -9.71)
Non-fatal	-10.02 (-9.90; -10.18)	-3.82 (-3.77; -3.88)	-100.23 (-98.95; -101.80)
AMI event	-1.79 (-1.81; -1.77)	-0.68 (-0.69; -0.68)	-17.93 (-18.08; -17.75)
ACS event	-2.17 (-2.17; -2.16)	-0.83 (-0.83; -0.82)	-21.67 (-21.71; -21.62)
DALY	-47.75 (-47.25; -48.25)	-	-477.49 (-472.51; -482.46)

Source: Authors, based on the results presented.
DALYs, disability-adjusted life years; CI95%, 95% confidence interval; AMI, acute myocardial infarction; ACS, acute coronary syndrome; CVA, stroke.
[a] Rates per 100,000 were calculated using the population over the age of 30 that visited the health stations in 2014 (n = 262,242).

users of the public health system, and those who visited stations in the south of the city. The health stations therefore appear to promote a more equitable distribution of the benefits in favor of the most disadvantaged and socially vulnerable groups through the knowledge they gain about healthy lifestyles, healthy and risky behaviors, and their potential impact on their individual health and quality of life.

Beyond the clearly positive impact on user satisfaction, our study also estimated the expected benefits of the health stations in terms of CVD and years of healthy life. To estimate the health impact on "hard" health outcomes such as cardiovascular events and healthy years of life, our study used a prevalidated epidemiological decision model (16), together with parameters from domestic and international literature. We observed that the health stations contribute to small reductions in fatal and nonfatal cardiovascular events and gains in years of healthy life in the user population. These reductions, expressed per 100,000 population, are similar to the results of public health interventions focusing on lifestyles (16). Since healthy habits help prevent the development of other chronic diseases, the effect could be greater.

The limitations of the study include the fact that its cross-cutting design makes it impossible to determine cause-and-effect relationships, since the data were collected at a particular point in time and, moreover, the survey was not administered to a control group that did not receive the intervention. Notwithstanding, cross-sectional studies provide important information for health service planning and administration

(38). It should also be borne in mind that although the questionnaire was self-administered, it cannot be ruled out that the respondents may have tried to please the interviewers (courtesy bias) (38). With regard to the component for estimating the health impact, mention should be made of the general limitations of this type of modeling study (39). In any case, this type of analysis is soundest on the numerous occasions when a randomized study with long-term follow-up is neither feasible nor viable, as in the case of the health stations. Another limitation is the primary source of information used, since the program's database was designed for another purpose; thus, some missing data had to be obtained from additional information sources. However, even this observation is useful in evaluating the program, as it will lead to improved data collection that will permit another type of analysis in the future. Furthermore, the characteristics of the people who use the health stations may differ from those of people who decide not to, especially those who come with clear expectations of receiving some service and are thinking about or ready to take action to change (self-targeting bias) (40), and the results could differ in the population that currently does not use the stations.

The strengths of the study include the fact that sampling of the health stations was random, representative of the totality of the health stations, and stratified by type and geographical area. This enables generalization of the results to all health station users. Furthermore, most of the dimensions studied come from the qualitative research on the same population, and the survey results add an estimate of the proportion in which these

preliminary findings are distributed in the population. The coherence between the qualitative and quantitative findings supports the plausibility of the results (14). Moreover, the use of a probabilistic calibrated model with vital statistics made it possible to obtain a conservative measure of the impact on morbidity and mortality from CVD, one of the principal chronic diseases.

Conclusions

This study evaluated users' perceptions and the health impact of a health promotion initiative in a major city. The health stations were found to be good facilities for conducting health promotion and disease prevention activities, contributing to the detection and monitoring of high blood pressure and blood glucose and health education about risk factors, healthy eating, and physical activity, especially in the most vulnerable population subgroups. Furthermore, the health stations were associated with self-perceived improvements in lifestyle. Given the expected changes in risk factors, health station users have the potential to reduce cardiovascular morbidity and mortality and gain years of healthy life.

Conflicts of interest. None declared.

Disclaimer. Authors hold sole responsibility for the views expressed in the manuscript, which may not necessarily reflect the opinion or policy of the RPSP/PAJPH or the Pan American Health Organization.

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RESUMEN

Evaluación del impacto sanitario del Programa Estaciones Saludables en la Ciudad Autónoma de Buenos Aires, Argentina

Objetivo. Explorar las motivaciones y expectativas de los usuarios del Programa de Estaciones Saludables en la Ciudad Autónoma de Buenos Aires y evaluar su potencial impacto sanitario.

Métodos. Se realizaron entrevistas en profundidad (n = 34) y una encuesta autoadministrada (n = 605) a usuarios del programa. Se desarrolló un modelo epidemiológico para estimar el impacto del programa sobre los eventos cardiovasculares y los años de vida ajustados por discapacidad (AVAD).

Resultados. Los principales factores motivadores para el uso de las estaciones saludables fueron la accesibilidad geográfica, económica (servicios gratuitos) y la satisfacción con la atención recibida. El 14,4% (intervalos de confianza del 95% [IC95%] 10,3–18,5%) de los usuarios hipertensos y el 24,8% (IC95% 17,6–32,0%) de los diabéticos informó haberse enterado de sus valores alterados en las estaciones saludables. Más de la mitad de los encuestados reportó alguna mejora de conocimientos sobre los beneficios de realizar actividad física y una alimentación saludable; esto fue más frecuente entre los usuarios más jóvenes, de menor nivel educativo, usuarios del sistema público de salud, usuarios de estaciones saludables de la zona sur y los que tenían algún factor de riesgo cardiometabólico (p<0.05). Se estimó que debido a la existencia de estaciones saludables se evitarían 12,5 eventos cardiovasculares y cerebrovasculares por año en la población asistida (4,75 eventos/100 000 personas) y 47,75 AVAD por estas causas.

Conclusiones. Las estaciones saludables resultan un espacio propicio para la implementación de acciones de promoción de la salud y prevención, contribuyendo en la detección y facilitando el monitoreo de los factores de riesgo, con potencialidad para prevenir eventos cardiovasculares y sus consecuencias.

Palabras clave Promoción de la salud; prevención primaria; estilo de vida saludable; conocimientos, actitudes y práctica en salud; enfermedades cardiovasculares; evaluación en salud; Argentina.

RESUMO

Avaliação do impacto na saúde do Programa Estações Saudáveis na Cidade Autônoma de Buenos Aires, Argentina

Objetivo. Explorar as motivações e expectativas dos usuários do Programa Estações Saudáveis na Cidade Autônoma de Buenos Aires e avaliar seu impacto potencial na saúde.

Métodos. Foram realizadas entrevistas em profundidade (n = 34) e uma pesquisa auto-administrada (n = 605) a usuários do programa. Um modelo epidemiológico foi desenvolvido para estimar o impacto do programa em eventos cardiovasculares e anos de vida ajustados por incapacidade (DALY).

Resultados. Os principais fatores motivadores para o uso do estações saudáveis foram a acessibilidade geográfica, econômica (serviços gratuitos) e a satisfação com o atendimento recebido. 14,4% (intervalo de confiança de 95% [IC95%] 10,3-18,5%) de usuários hipertensos e 24,8% (IC95% 17,6-32,0%) dos diabéticos relataram ter aprendido sobre seus valores alterados na estação saudável. Mais da metade dos entrevistados relataram alguma melhora no conhecimento sobre os benefícios da atividade física e da alimentação saudável, com maior freqüência entre os mais jovens, de menor escolaridade, usuários do sistema público de saúde, usuários de estações saudáveis na zona sul e aqueles que apresentaram algum fator de risco cardiometabólico (p<0,05). Estimou-se que, devido à existência de estações saudáveis, 12,5 eventos cardiovasculares e cerebrovasculares por ano seriam evitados na população atendida (4,75 eventos/100 000) e 47,75 DALY por essas causas.

Conclusões. As estações saudáveis são um espaço propício para a implementação de ações de promoção e prevenção da saúde, contribuindo para a detecção e facilitação do monitoramento dos fatores de risco, com potencial para prevenir os eventos cardiovasculares e suas consequências.

Palavras-chave Promoção da saúde; prevenção primária; estilo de vida saudável; conhecimentos, atitudes e prática em saúde; doenças cardiovasculares; avaliação em saúde; Argentina.