

Improving Population Health Through Integration of Primary Care and Public Health: Providing Access to Physical Activity for Community Health Center Patients

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Integrating preventive recommendations into clinical work with individual patients is a complex and multifaceted obligation with competing priorities. Addressing preventative recommendations alone for patients in a typical day requires in excess of 7.4 hours.¹ Health care providers in community health centers (CHCs) are well aware that chronic medical conditions disproportionately afflict low-income and minority inner city residents, and are only able to address dietary and exercise recommendations at about 32% of preventive visits.² Nevertheless, clinicians acutely understand their public health obligation to address sedentary lifestyle and poor nutrition as contributors to the burgeoning public health problems of obesity, diabetes, and cardiovascular conditions.

Lifestyle changes are initial steps toward preventing and addressing chronic disease though facilitating lifestyle interventions for disadvantaged urban patients is complicated.⁴ While problems concerning dietary choices and changes for this population have been intensively investigated,⁵⁻¹⁴ the specific barriers to increased physical activity for low-income minority adults have received less attention.¹⁵⁻²⁰ With few exceptions, research on strategies to increase physical activity among at-risk populations has focused on psychological or behavioral or motivational approaches to physical activity as opposed to alterations in the availability of access to exercise.²¹ Low-income minority adults face a multitude of potential barriers to exercise. Some are personal, such as childcare issues; some are ethnic or cultural, such as lack of models of exercise for women; and some are structural, specifically lack of convenient, safe, low-cost or public indoor sites for physical activity.²²⁻²⁴

Moreover, clinicians are still a major source of advice to patients and play catalytic roles in

Objectives. Our community health center attempted to meet public health goals for encouraging exercise in adult patients vulnerable to obesity, diabetes, hypertension, and other chronic diseases by partnering with a local YMCA.

Methods. During routine office visits, providers referred individual patients to the YMCA at no cost to the patient. After 2 years, the YMCA instituted a \$10 per month patient copay for new and previously engaged health center patients.

Results. The copay policy change led to discontinuation of participation at the YMCA by 80% of patients. Patients who persisted at the YMCA increased their visits by 50%; however, more men than women became frequent users after institution of the copay. New users after the copay were also more likely to be younger men. Thus the copay skewed the population toward a younger group of men who exercised more frequently. Instituting a fee appeared to discourage more tentative users, specifically women and older patients who may be less physically active.

Conclusions. Free access to exercise facilities (rather than self-paid memberships) may be a more appropriate approach for clinicians to begin engaging inexperienced or uncertain patients in regular fitness activities to improve health. (*Am J Public Health*. 2012;102:e56–e61. doi:10.2105/AJPH.2012.300958)

helping them initiate changes in diet, exercise, and smoking. At the same time, providers cannot easily alter the difficult economic, social, and environmental challenges that discourage healthy behaviors. Even when clinicians discuss exercise with patients, they are unlikely to assist them in setting goals for physical activity and even less likely to help arrange access to fitness centers.³ Thus, we established a partnership with a community fitness center and arranged access to determine whether arranged access and referral leads to regular patient usage.

In this context, our federally qualified community health center in New England arranged for adult patients (aged 19 years and older) to have open access to swimming and exercise facilities at the local YMCA through a contract between the 2 agencies to subsidize patients' access. This project meshes with the expressed preferences of low-income minority women, in particular, for free gym access.²⁵ Initially,

access was free for referred health center patients; after 2 years, the YMCA began to charge patients \$10 per month for access (full members paid \$30/month). The imposition of the copay on an already functioning program provided the opportunity for a natural experiment. We questioned how a new copay influences usage among patients who had already had free access for 2 years. Would the knowledge of the copay before initiating exercise alter the demographics of the patients who chose to go to the YMCA? The aim of our study was to describe patient demographics and utilization patterns among those who attended before the copay and stopped (pre-copay), those who attended before the copay and continued afterward (persisters), and those who began to use the YMCA after the imposition of the copay (copay). We also continued a similar but smaller open access project at the local YWCA that had begun 2 years earlier and continued to offer open access to patients

(without copay) over the same time period. The results of our work with our patients at the YMCA are described elsewhere.²⁶

METHODS

We had planned a descriptive longitudinal evaluation of exercise referral and YMCA visit patterns from August 2006 through September 2010. Our goal was to understand how an urban health center population would use the nearby YMCA when access was provided by the health center. The first 2 years of the program were offered to patients for free. During the following 2 years there was a program modification and the YMCA contract with the health center was changed. The new program structure provided 1 month of free access and then patients would be required to pay \$10 copays for each month of use. This natural experiment captured 4 years of exercise visit data. The first 2 years of data (2006–2008) served as a control because visits made during this time were free to each patient. We offered exercise to adult patients for whom lifestyle modifications were key to chronic disease management. Later a wide range of patients began requesting access independently as word spread through the community. We did not limit access only to those patients with risk factors. Providers cleared nearly all patients for access and excluded only those with severe cardiovascular disease or major functional limitations that would preclude safe exercise. Enrollment began during office visits when providers offered access to exercise and patients accepted the referral. Providers supplied each patient with an exercise prescription comprising verbal and written instructions and a list of approved activities, which was sent to the YMCA coordinator. Patients signed a required release of medical information to the YMCA as well as research forms required by the institutional review board of the University of Massachusetts Medical School. Patients assumed responsibility for their transportation, personal arrangements, and scheduling of their gym time. The costs of the entire exercise program from September 2006 through August 2008 were completely covered (100% of fees paid by health center grants). Precopay patients paid nothing out of pocket for unlimited access to the facility including on-site

child-care for those needing it. During these 2 years, precopay patients signed in on a paper-based attendance log, which the authors reviewed to confirm patient identity and examine attendance patterns.

In September 2008, the YMCA introduced the copay described above for adult patients using the fitness center. Beginning at this time, the YMCA issued magnetic membership cards to patients, with electronic sign-in replacing handwritten, logged admission. Established users who previously exercised between 2006 and 2008 received 1 additional month of free access during September 2008, and began paying the \$10 monthly copay thereafter. Child-care services were still included for enrolled patients. We recognize individuals who began using the facility after September 2008, as “copay” patients. We omitted the fewer than 20 visits made during the transitional month of September 2008 because the YMCA was troubleshooting the electronic sign-ins and adapting to the new fee structure. As with the precopay patients, copay patients also coordinated their own transportation and exercise schedules.

We described persisters as patients who were enrolled during the precopay period and continued attending after the copay. Persisters were willing to pay for exercise out-of-pocket going forward after having free access during the time when they had established their attendance patterns. A visit was defined as a sign-in event at the YMCA (on paper during the precopay period or electronically after the copay began) and an active month is defined as a calendar month during which at least 1 sign-in occurred. Inactive months were those lacking at least 1 sign-in. We created a variable described as user visits per active month as a measure of exercise frequency. Additionally, we studied visits from 2008 to 2010 in the cold-weather months (November–April) and warm-weather months (May–October) to evaluate basic seasonal usage patterns. We described copay patients as those who were enrolled after the copay period and were expected to pay \$10 monthly copays following the introductory month.

We examined patient demographic data constituting gender, ethnicity, language spoken, and health insurance type to explore relationships between individual user characteristics

and exercise frequency. We also measured the distance from each patient’s address to the YMCA using Google Maps, available online.²⁷ The characteristics of those who were referred by providers but never attended were not abstracted. The amounts of missing data were substantial for patients’ language preference so we did not analyze this category. We sought to determine health insurance coverage based on registration data but found many patients without insurance information in the practice management software. In our survey of low-income patients, insurance eligibility frequently changes, and many patients have no coverage. Moreover, the software could not provide any retrospective insurance data. Thus we were unable to reliably determine insurance coverage at the time of enrollment for many patients.

We used univariate analyses to describe the study population and to report on the frequency of YMCA visits. We calculated mean, standard deviation and 95% confidence intervals for normally distributed variables, and used paired *t*-tests for evaluation. Medians and interquartile range were used for nonnormally distributed variables and evaluated with the Wilcoxon Signed Rank test. *P* values of $\leq .05$ were considered significant. Unadjusted odds ratios and all statistical tests were calculated by JMP and SAS statistical software (both packages by SAS Institute, Cary, NC). This project was reviewed and approved by the University of Massachusetts Medical School institutional review board.

RESULTS

Providers cleared 99.8% of patients for exercise at the YMCA. In general, visit history was nonnormally distributed in the precopay and copay periods. We observed an approximate Pareto distribution characterizing exercise visits during the precopay and copay periods indicating that 25% of patients accounted for 80% of the 18 879 visits. There were 513 health center patients who used the YMCA during the precopay period making 8125 visits (September 2006–August 2008). Women made up almost two thirds of health center patient users (Table 1). The mean \pm SD age during precopay visits was 38.7 ± 14.2 years, with no difference between the mean ages of men and women. The mean \pm SD

TABLE 1—Demographic Characteristics and YMCA Visit Frequency Among Health Center Patients: Improving Population Health Through Integration of Primary Care and Public Health, New England, August 2006–September 2010

Variable	Precopay (n = 513), No. (%), Mean \pm SD, or Mean \pm SD (Median)	Copay (n = 348), No. (%), Mean \pm SD, or Mean \pm SD (Median)	Persister (n = 102), No. (%), Mean \pm SD, or Mean \pm SD (Median)
Gender			
Male	174 (34)	155 (45)	38 (37)
Female	313 (61)	189 (55)	64 (63)
Missing	26 (5)	4 (<1)	
Age at first visits, y			
Overall	38.7 \pm 14.2	35.2 \pm 12.6	38.8 \pm 13.4
Men	38.5 \pm 14.1	33.5 \pm 13.4	39.7 \pm 14.8
Women	38.5 \pm 13.1	36.8 \pm 11.8	39.2 \pm 12.4
Ethnicity			
Latino	334 (65.2)	250 (71.9)	71 (69.6)
White	84 (16.4)	46 (13.2)	15 (14.7)
African/African American	53 (10.4)	27 (7.8)	7 (6.9)
Asian/Pacific Islander	25 (5)	11 (3.2)	2 (2)
Other	4 (1)	8 (2.3)	5 (5)
Missing	8 (2)	6 (1.6)	2 (2)
Insurance			
Mass Health	122 (23.8)	75 (21.6)	17 (16.7)
Commercial	85 (16.6)	75 (21.6)	35 (34.3)
Medicare	37 (7.2)	8 (2.3)	11 (10.8)
Health Safety Net	38 (7.4)	58 (16.7)	12 (11.8)
Self-pay	71 (13.8)	38 (10.9)	9 (8.8)
Other	4 (<1)	4 (1)	2 (2)
Missing	156 (30.4)	90 (25.9)	16 (15.7)
Language			
English	172 (34)	76 (21.8)	44 (43)
Spanish	102 (20)	78 (22.4)	48 (47)
Other	19 (3.1)	7 (2.4)	3 (3)
Missing	220 (42.9)	186 (53.4)	7 (7)
Total visits			
Per active month	3.0 \pm 2.1 (2.4)	...	5.1 \pm 4.4 (4.2)
Men	2.4 \pm 2.2 (1.7)	5.6 \pm 4.4 (4.5)	3.8 \pm 2.5 (3.0)
Women	2.4 \pm 1.8 (2.0)	4.1 \pm 2.8 (3.5)	2.5 \pm 1.6 (2.0)

number of visits per active month was 3 ± 2.1 before copay and did not differ by gender.

Overall, 102 (19.9%) of the 513 initial users continued exercise at the YMCA after the institution of the copay thereby becoming our persisters. Patients in the persister group made 36% of total health center patient visits to the YMCA during the 4 study years. Similar to the precopay period, women made up almost 2-thirds of this group (63%). Mean age among

persisters was 39.4 ± 13.3 years, without difference in age between the women and men. Overall, the mean \pm SD number of visits per active month for men and women was higher after copay compared with precopay access (5.1 ± 4.4 vs 3.0 ± 2.1 ; $P < .001$, respectively). As shown in Table 1, men made more visits per active month than women, but because women represented a larger proportion of exercisers, the total visits by gender between

the 2 study periods was similar. Mean \pm SD visits per user per active month increased by 2.1 ± 4.3 ($P < .001$) visits when persister patients began paying for exercise; median visits per user per active month also increased by 1.8 (4.2 vs 2.4; $P < .001$) visits. Men who became persisters had a higher usage pattern than other men in the precopay period (3.00 vs 1.67 median visits/month; $P < .05$). Women persisters had similar visit patterns before and after the fee (2.5 vs 2.4 median visits/month; $P > .05$). Persisters were more likely to be Latino (70%) and at least one third of this group had commercial insurance at the time of enrollment, which is a higher proportion than the overall health center population (data not shown).

Patients made more visits during the warm-weather (May–Oct) months (74%) as opposed to cold-weather (Nov–Apr) months (26%). Mean \pm SD visits per user per active month also increased during the warm-weather months (4 ± 4.04 vs 5.2 ± 3.8 ; $P = .005$). The odds of making 9 or more visits increased in the warm-weather months (OR = 2.8; 95% CI = 1.23, 6.33; $P = .01$); the odds of making 4 or fewer visits was higher in the cold-weather months (OR = 2.2; 95% CI = 1.4, 3.5; $P < .001$).

In contrast to other findings, distance did not appear to be a barrier to use. As expected, those who lived closest attended most often with 75% of visits made by those living within 3 miles of the YMCA and 90% by those living within 5 miles.¹⁷

DISCUSSION

The goal of this project was to provide an opportunity for adult primary care patients from a vulnerable population to improve their health through open access to exercise—a structural change targeted to promote health equity. Patients of our CHC in New England made modest use of the exercise option (approximately 2.5 visits/month per patient) at a local YMCA when fully sponsored access was offered. Women, in particular, constituted 61% of the patient users of the YMCA prior to the copay when access was free and 55% afterward, supporting previous research showing the preference for free gym access by low-income minority women to enhance

their physical activity.²⁶ When a \$10 per month copay was instituted, 80% of all prior exercising patients stopped attending. Although commercial fitness centers and gyms have rates of attrition of 35% to 40%,²⁸ the 80% participation drop seen with our patients at the YMCA after the copay suggests this population was twice as sensitive to membership costs that are 33% or less than those at commercial fitness centers. The major decrease in participation among a predominantly Latino population in our study shows that a modest cost greatly limits participation of low-income people from making use of an exercise facility, thus revealing the correlation between health behaviors and monetary barriers.

A similar program for somewhat older community health center patients (95% between 40 and 69 years old; 40% Hispanic) with inadequately controlled diabetes in Sioux City, Iowa,²¹ also in conjunction with a YMCA, reported parallel outcomes. In that study, 48 patients took up the opportunity to attend free twice-weekly classes at the local YMCA over the course of a year. In addition, all patients were offered a free 3-month open access membership period. However, only 5 patients (11% of those who ever attended) chose to enroll in the subsequent scholarship-assisted membership program for about \$9 per month—almost the same cost as the copay in our project.

Those in our program who persisted after the fee made more visits per active month suggesting that persisters determined that the gym access which previously cost zero dollars per year was worth \$120 dollars annually out of pocket. Full members at the YMCA paid \$30 per month or \$360 yearly during this time. The persister group's higher usage suggests increased commitment to exercise in the context of a required payment, supporting the oft-mentioned idea that people paying for exercise value it more. Another explanation for more visits among the persister group after the copay likely results from longer term participation at the YMCA (up to 2 years of prior acclimatization from 2006–2008) leading to increased comfort in an environment promoting physical activity. Alternatively, there may have been more patients in the persister group who could not afford the typical cost of private fitness center membership and

considered this a value, thus attending more frequently.

Patients who joined the exercise program after the fee application were more likely to be men (48% men after vs 34% men before) whose average age was 5 years younger and who tended to exercise more frequently than the male users who dropped out after the fee. Thus, men who exercised less frequently were more likely to become dropouts and women were less likely to become new patrons of the YMCA after the institution of a fee for exercise. Thus, institution of a fee selected for a younger male clientele who used the facility more frequently. Perhaps motivated women were exercising as frequently as the constraints in their lives allowed. In our related study of completely open access offered to the same patient population at the local YWCA from 2004 to 2006, we found that 66% of the users were women, and the mean age of men and women users combined was 38.5 years, showing almost the same demographic of age and gender as YMCA users before the fee.²⁸ This was followed by a slow attrition from 2006 to 2010 as no new users were being enrolled at the YWCA, but there was no sudden decline in usage at the end of 2008. Thus, the fee at the YMCA appeared to select for a somewhat different demographic from that of patients of the health center who chose to take advantage of open access to exercise at either facility. The national economic disruption of 2008 may have led some younger men, who were previous patrons of more expensive commercial fitness clubs, to take advantage of the low-cost YMCA membership when their disposable income decreased. Another explanation may be that women were affected more by the copay than were men, but this would not explain the relationship between copay and age. In addition, men in this group could have fewer competing responsibilities, more discretionary time for exercise and fewer logistical barriers to attendance. Working single mothers with long hours and older women who care for children, grandchildren, and other family members may have fewer opportunities to exercise or visit a fitness center. Unfortunately, we were not able to identify and capture data required to support these observations.

The overall skewing toward a younger male population of frequent exercisers suggests

that instituting a copay for exercise may discourage a potentially vulnerable population of women and older patients with chronic illness from engaging in increased physical activity. The lower participation of the precopay group compared with the copay and persister groups suggests that the precopay group may have consisted of more tentative users. The Sioux City CHC–YMCA open access project also found a high proportion of tentative exercisers with 64% of their patients participating less than once a week over the course of a year. We have shown that instituting a low fee for access to safe indoor exercise facilities reduces access and thus undermines the goal of improved population health.²¹ Completely open access to exercise may be a more appropriate way to involve tentative older users with health problems in regular fitness activities.

Our early expectations were that access to indoor exercise would enable patients to be active during the cold-weather months. However, we found greater use of indoor exercise in the warmer months. This finding suggests that cold weather itself poses a barrier in getting to the exercise facility. Other authors studying exercise in northern climates have also found decreased indoor exercise in cold or inclement weather.¹⁵ This unexpected finding regarding climate is helpful because those doing similar work may learn to plan recruiting and enrollment during warmer months to maximize uptake and outreach.

STRENGTHS AND LIMITATIONS

The strengths of this work include a representative group of urban low-income patients and partnership with the YMCA, which has more than 2600 locations nationally. Health centers planning to arrange access to exercise for low-income patients benefit from partnering with an institution that improves the lives of their members through physical activity and embraces social responsibility.

Our results have several limits and constraints. First, our data are observational and pertain only to those patients who attended the YMCA after referral by their primary care provider. Patients who did not accept the offer and did not attend were not studied because our work used a real-life approach in a primary

care clinic with limited resources. Secondly, we did not have the ability to track the intensity or duration of exercise when patients are at the YMCA, nor were we able to document instances of physical activity occurring outside the YMCA such as exercise at home, in parks or in other situations. Our measure of exercise is limited to frequency of YMCA visits, which we accepted as a surrogate for physical activity. Because there is a paucity of data on fitness-center utilization, we were unable to compare our visit patterns against those of another center. Third, we were not able to fully explore relationships between visits and health insurance or socio-economic variables because these data are incomplete in our practice records and subject to patient self-report bias. Some patients may underreport insurance coverage and resources to minimize any charges that might be applied to their health care. Thus, we were able to compare a limited set of characteristics of the exercise groups to the demographics of adult patients of the health center as a whole. In general, patients who exercised at the YMCA during the precopy period appeared to be representative by gender of the adult health center patient population (i.e., approximately 60% women) with a stronger participation of Latinos—65% of exercisers versus 50% Latino patients. Finally, our work reflects the exercise patterns of the users with the unique demographics of patients of our CHC, located in a medium-sized city in New England and may not pertain to other populations who differ by ethnicity, income, or geography. However, the demographics of our patient population are typical for health centers in New England cities. Future research in this area should evaluate intensity and duration of physical activity as well as frequency. Also, it is unclear how behaviors and routines change over 5 or more years and whether maintaining routines incorporating regular physical activity improves overall population health.

CONCLUSIONS

Our results show that policies aimed at improving the health of a low-income population can be developed through integrating primary care and public health. Specifically, our study demonstrates that providers can develop programs with fitness organizations to

create resources for members to engage in health promoting activities. Our study also suggests that modest user fees have a major influence on exercise uptake and continuation among urban health center patients. However heartening it is to see that the user fee can be associated with greater usage intensity for some, it is discouraging but not surprising to document that the majority (80%) of patients who utilized the YMCA facility when use was fully subsidized stopped attending completely once the copay was instituted. As we implement prevention initiatives, we must be mindful about the impact of fees in vulnerable populations. If we are to achieve health equity, we must reduce differences in health linked to unequal social and economic conditions. ■

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Contributors

M. Silva, S. Cashman, and L. M. Candib contributed to the design, methods, analysis, interpretation, and writing. P. Kunte contributed to the methods, analysis, and interpretation.

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Human Participant Protection

This study was reviewed and approved by the University of Massachusetts Medical School institutional review board.

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