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The Medically Underserved: Who Is Likely to Exercise and Why?

Susan Labuda Schrop, MS
Brian F. Pendleton, PhD
Gary McCord, MA
Karen M. Gil, PhD
LuAnne Stockton, BA, BS
Joshua McNatt, MD
Valerie J. Gilchrist, MD

Abstract: Adults who exercise regularly have better health, but only 15% of U.S. adults engage in regular exercise, with some social groups, such as people with lower incomes and women, having even lower rates. This study investigates the rate at which medically underserved patients receive exercise counseling from health care providers, characteristics of those who exercise, and barriers and motivations to exercise. The convenience sample was predominantly female and White and exclusively low-income and uninsured or underinsured. On average, participants were obese, by Federal Obesity Guidelines; 43% smoked.

Although 60% of 126 patients reported that providers discussed exercise with them, the discussions had no relationship with patients' engagement in exercise. Women and those with lung problems, diabetes, or children in the home were less likely than others surveyed to exercise. The highest rated motivations included body image and health issues. The most important barriers were time, cost, and access to exercise facilities and equipment.

In order for exercise counseling to be more effective, health care providers' interventions must consider patients' personal characteristics, health status, readiness to engage in an exercise program, and motivations and barriers to exercise.

Key words: Medically underserved, exercise, preventive health, stages of change, health promotion.

There is strong evidence that physical activity and physical fitness reduce mortality and morbidity for chronic health conditions, including cardiovascular diseases such as hypertension and coronary heart disease, obesity, diabetes, osteoporosis, and mental health disorders.[1] However, only 15% of adults in the U.S. engage in

SUSAN LABUDA SCHROP *is Associate Director for Administration in the Department of Family Medicine at Northeastern Ohio Universities College of Medicine (NEOUCOM) (with which* ***GARY MCCORD*** *and* ***LUANNE STOCKTON*** *are also affiliated) and can be reached at sschrop@neoucom.edu.* ***BRIAN PENDLETON*** *is a Professor in the Department of Sociology at the University of Akron.* ***KAREN GILL*** *is Director of OB Resident Research at Akron General Medical Center,* ***JOSHUA MCNATT*** *is a Family Medical Resident at Aultman Hospital in Canton, Ohio, and* ***VALERIE GILCHRIST*** *is Chair and Professor in the Department of Family Medicine at East Carolina University.*

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the recommended amount of physical activity, and some populations (including women, those with lower incomes and less education, African Americans, and Hispanics) exercise significantly less than others.[2]

The U.S. Preventive Services Task Force recommends that all patients be counseled to incorporate physical activity into their daily routines and that clinicians determine each patient's physical activity level, ascertain barriers specific to that individual, and provide information on the role of physical activity in disease prevention.[1]

Americans in low socioeconomic status (SES) groups suffer disproportionately from almost every disease and show higher rates of mortality than those in higher strata.[3,4] The medically underserved receive less necessary primary care than other populations,[5,6] and when they do seek primary care, their problems tend to be complex and severe.[7]

When people intend to modify a problem behavior or acquire a positive behavior, they move through five stages: precontemplation, contemplation, preparation, action, and maintenance.[8,9] Those in the *precontemplation* stage have no intention of taking any action in the foreseeable future, usually considered the next six months. Those intending to change in the next six months are in the *contemplation* stage. Those intending to take positive action to change a behavior in the near future (one month) are in the *preparation* stage. The *action* stage is characterized by lifestyle modifications within the past six months. Finally, once the behavior has been changed for at least six months, people are considered to be in the *maintenance* phase.

Stages-of-change research is in its infancy, and the reliability and validity of stage distributions for health-risk behaviors other than smoking (including exercise) are not well known, although LaForge and colleagues have conducted important descriptive work.[9,10] For exercise, they found that less than half of two U.S. samples were in maintenance (39.5% and 47.4%), and a smaller proportion were in the action stage (10.6% and 7.9%). The remaining stage distributions were precontemplation (18.4% and 14.5%), contemplation (13.5% and 8.5%) and preparation (18.0% and 21.6%).

People choose to exercise or not to exercise for a variety of reasons, often influenced by perceived lack of time and dissatisfaction with weight and appearance.[11] Low-income adults are less likely than others to exercise at recommended levels; location of residence, access to walking/jogging trails and parks, and companionship for exercise matters to this group.[12] Others have found the following barriers to exercise for low SES groups: lack of time, feeling too tired, obtaining enough exercise at one's job, having no motivation,[13] poor health, inconvenient access, and low personal functioning.[14]

Among racial/ethnic minorities, documented barriers to exercise include cost, child care responsibilities, a high crime rate and fear for personal safety, and how important physical activity is to members of the minority group.[15] Among women aged 20–50, Eyler found that family priorities were the main barrier across racial/ethnic groups, and that specific cultural barriers, lack of community support, and lack of past experience with exercise also played important roles.[16] Mothers receiving

assistance from the Women, Infants and Children (WIC) Program for low-income populations, identified exercise with a sense of accomplishment, increased strength, stress relief, and getting in shape after pregnancy; negative associations included fatigue, need for child care, and practical impediments of cold weather.[17,18]

Motivations for African American women to start exercising include health concerns; weight control; stress reduction; the desire to feel good and have energy; and the influence of others.[19] Other researchers with African American women found that decisions to exercise were influenced by feeling tired, lack of time, cost, support from family and friends, need for child care, weather, access to facilities or places to walk outdoors, safety concerns, and inflexible work environments, among other things.[18,20] Depression; health care provider discussion of physical activity; and perceived risk of such consequences as falls, injuries, and heart attacks influence the decisions of older African American and rural older women to exercise or not.[21]

Physician intervention is an important step in beginning and maintaining a physically active lifestyle. In a study incorporating direct observation of community-based family practice encounters, patients were up to date on only 9% of health habit counseling; exercise counseling occurred in 35% of well visits and 14% of illness visits.[22] Wee and colleagues found the national rate of physician counseling about exercise to be 34%, and that physicians are more likely to counsel patients with cardiovascular disease and diabetes and less likely to counsel patients who are relatively sedentary.[23] Taira and colleagues found that physicians were less likely to discuss exercise with low-income patients who were in need of these discussions than with their high-income counterparts.[24]

Our research investigated exercise among low-income, uninsured or underinsured men and women. We posed seven questions. 1) What is the stage of change distribution regarding exercise behavior in this population? 2) What characteristics of the respondents (e.g., sex, race, marital status; health status and chronic health problems; smoking; employment; children; discussions with health care providers) are related to exercise in this population? 3) Do respondents receive exercise counseling from their health care providers? 4) Does exercise counseling have any effect on respondents' stages of change? 5) What are the barriers for those who currently do not exercise? 6) What are the motivations and barriers for those who intend to exercise? 7) What are the motivations for those who are exercising?

Methods

Subjects. Five community-based primary care practices for the medically underserved in Northeast Ohio served as the study sites. Four are considered free clinics, and one is a federally-qualified community health center. They provide a range of 1,100 to 9,500 primary care visits annually. Basic patient demographic information is provided in Table 1.

Measures and procedures. A trained interviewer with demonstrated skill in face-to-face interviews and communication with low-literacy-level patients collected the data. Patients were approached in the waiting rooms of the sites and were asked if they were interested in answering some questions about themselves

Table 1.

PROFILE OF STUDY SITES

Site	% Female patients	Racial composition of patients		
		% White	% African American	% Other
1	60	57	35	8
2	61	52	43	5
3	83	76	18	6
4	58	55	36	9
5	72	89	5	6

and their feelings about exercise. Exclusion criteria included not speaking English, being younger than 18 years old, appearing acutely ill, or appearing cognitively impaired at the time of the interview. Interviews were conducted in the waiting room; no compensation was provided. All participants provided written informed consent to participate.

Demographic information collected included age, sex, race (White/other), marital status (married/other), children under the age of 18 currently living in the household (yes/no), and employment status (yes/no, with yes including both full and part-time employment). Participants were also asked their height, weight, and smoking status (yes/no), and whether their health care provider ever discussed exercise with them (yes/no).

To determine whether comorbidities were related to exercise, participants were asked a closed list of questions regarding whether or not they had any on-going health problems, including high blood pressure, lung problems, heart problems, arthritis or any joint problems, and/or diabetes or sugar problems.

In order to determine their stage of change regarding exercise, patients were read the following definition of *regular exercise* (adapted from the Cancer Prevention Research Center definition) and asked if they exercised regularly (most weeks) according to it: "Regular exercise is any planned activity such as brisk walking, aerobics, jogging, bicycling, swimming, etc. that is done to improve your physical fitness. The activity should be done three times each week for 20 minutes each time. Exercise does not have to be painful to be effective, but it should be done at a level that increases your breathing rate and causes you to break a sweat."[25] This liberal definition of exercise was used in order to capture the maximum number of respondents who exercise. Response choices from the stages of change construct were: *No, and I do not intend to in the next 6 months* (precontemplation); *No, but I intend to in the next 6 months* (contemplation); *No, but I intend to in the next 30 days* (preparation); *Yes, I have been for less than six months* (action); *Yes, I have been for more than 6 months* (maintenance).[9,25]

Using a five-point Likert scale ranging from 1 (not important) through 5 (extremely important), patients were asked to rate barriers and motivations to

exercise. Those who reported that they currently do not exercise were asked to rate 16 items assessing barriers. Those who reported that they intend to exercise rated the same barriers as well as an additional 16 items assessing motivation to and benefits of exercise. Those who reported that they currently exercise rated 15 items concerning benefits of exercise derived from discussions with patients, the literature, and the Cancer Prevention Research Center.[25] Questions were pretested and adapted for understandability and ease of administration with patients of low literacy.

Finally, using the interviewer administration script, all participants were administered the oral form of the SF-12 Health Survey® (standard 4-week recall version), a 12-item, standardized multipurpose measure of self-reported health status that measures both physical and mental functioning (used with permission from the Medical Outcomes Trust).[26]

The Institutional Review Board of the Northeastern Ohio Universities College of Medicine approved this study.

Analyses. Data analyses included descriptive statistics, chi-squares, Cohen's d, and point biserial statistics. Significant differences were determined at $p<.05$. All data were analyzed using SAS/STAT® software.*

Results

Respondent profile. Of the 144 adults approached to participate, interviews were completed with 126 (87.5%). Respondents had a mean age of 44.2 years (SD=12.5, range 18–72); most were White (69%) women (79%). Seventy four percent reported they had one or more chronic health problems, and 43% were current smokers who smoked an average of almost a pack (0.86 of a pack) a day. Thirty-three percent of the sample was married and 61% were unemployed.

Body mass index (BMI), a measure of obesity, was calculated from the patient-reported height and weight and averaged 30.85 (SD=8.2).

Table 2 presents national SF-12 norms and the rates for the present sample (on self-rated physical and mental health). The present sample scored lower than the general U.S. population and their scores were more dispersed. Both the physical and mental SF-12 component scores for this sample fell below the 25th percentile of the U.S. population.[26]

Stages of change. The stages of change distribution for exercise in this sample was 34% precontemplation, 7% contemplation, 10% preparation, 14% action, and 35% maintenance. Our sample data are reported in Table 3 along with comparison data from a general population provided by LaForge and colleagues.[10]

Characteristics predicting exercise. Table 4 provides stages of change information by patient characteristic and whether the characteristic is associated with

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Table 2.

SF-12 DESCRIPTIVE STATISTICS[a,b]

	Mean score	25th percentile	Standard deviation	Range
Physical component summary				
Study sample	40.55	—	11.15	20–64
U.S. population[a]	50.12	46.53	9.45	13–69
Mental component summary				
Study sample	42.23	—	12.62	16–65
U.S. population[a]	50.04	45.13	9.59	10–70

[a]The SF-12 Health Survey® is a 12-item, standardized multipurpose measure of self-reported health status that measures both physical and mental functioning.
[b]Ware JE, Kosinski M, Keller SD. SF-12®: How to score the SF-12 physical and mental health summary scales. 2nd ed. Boston: The Health Institute, New England Medical Center, 1995.

exercise. For each comparison, the row variable is discrete and the stages of change are treated as ordinal, necessitating Cohen's d[27] and the point biserial correlation. For the purposes of comparison, the more common chi-square also is presented.

Sex proved to correlate with exercise stage of change: men were more likely than women to exercise currently, and women were more likely not to exercise or intend to exercise. Race, marital status, and employment status did not correlate significantly. The age distribution showed no differences.

Table 3.

STAGE OF CHANGE PERCENTAGE DISTRIBUTIONS FOR EXERCISE

	Do not intend to exercise	Intend to exercise	Currently exercise
Sample	**Pre-contemplation stage (%)**	**Contemplation & preparation stages (%)**	**Action & maintenance stages (%)**
Study sample	34.4	16.8	48.8
HMO patients[a]	31.9	28.6	39.5
Random digit dialing[a]	23.0	29.5	47.4

[a]Source: LaForge RG, Velicer WF, Richmond RL, et al. Stage distributions for five health behaviors in the United States and Australia. Prev Med. 1999 Jan;28(1):61–74.

Table 4.

PATIENT CHARACTERISTICS AND CORRELATION WITH STAGES OF CHANGE

	Do not intend to exercise	Intend to exercise	Currently exercise			
Characteristic	**Precon-templation stage (%)**	**Contemplation & prep-aration stages (%)**	**Action & mainte-nance stages (%)**	**Chi-square** χ^2	**Cohen's** *d*	**Point biserial** $r_{Y\lambda}$
Sex				8.00*	.65	.31**
Female – 100 (79.2%)	39.4	18.2	42.4	(high		
Male – 26 (20.8%)	15.4	11.5	73.1	medium)		
Race				.33	–.10	–.05
Other – 39 (31.2%)	30.8	18.0	51.2			
White – 87 (68.8%)	36.1	16.3	47.6			
Marital status				.16	.08	–.04
Married – 41 (32.8%)	36.6	17.1	46.3			
Other – 84 (67.2%)	33.3	16.7	50.0			
Chronic health problems						
Any chronic problem				2.80	.16	.08
No – 32 (25.6%)	25.0	25.0	50.0			
Yes – 93 (74.4%)	37.6	14.0	48.4			
High blood pressure				3.00	–.17	–.08
No – 72 (57.6%)	29.2	20.8	50.0			
Yes – 53 (42.4%)	41.5	11.3	47.2			
Lung problems				9.00**	–.56	–.27**
No – 104 (83.2%)	28.9	19.2	51.9		(medium)	
Yes – 21 (16.8%)	61.9	4.8	33.3			
Heart problems				.80	–.19	–.10
No – 101 (80.8%)	32.7	16.8	50.5			
Yes – 24 (19.2%)	41.7	16.6	41.7			
Arthritis/joint problems				.10	.01	.00
No – 68 (54.4%)	33.8	17.7	48.5			
Yes – 57 (45.6%)	35.1	15.8	49.1			
Diabetes				5.70	–.39	–.19**
No – 94 (75.2%)	28.7	19.2	52.1		(small	
Yes – 31 (24.8%)	51.6	9.7	38.7		medium)	
Smoker				2.00	.13	.06
No – 71 (56.8%)	36.6	19.7	43.7			
Yes – 54 (43.2%)	31.5	13.0	55.5			

(Continued on p. 283)

Table 4. *(continued)*

Characteristic	Do not intend to exercise Precontemplation stage (%)	Intend to exercise Contemplation & preparation stages (%)	Currently exercise Action & maintenance stages (%)	Chi-square χ^2	Cohen's *d*	Point biserial $r_{Y\lambda}$
Employed				3.70	.07	.03
No – 76 (60.8%)	38.2	11.8	50.0			
Yes – 49 (39.2%)	28.6	24.5	46.9			
Children under age 18 living at home				7.20*	–.35	–.17**
No – 73 (57.6%)	30.6	11.1	58.3			
Yes – 53 (42.4%)	39.6	24.5	35.9			
Health care provider ever discussed exercise				.10	–.03	–.01
No – 50 (40.0%)	34.0	16.0	50.0			
Yes – 75 (60.0%)	34.7	17.3	48.0			

*p≤.05; **p≤.01

Having one or more chronic diseases did not correlate with exercise behavior, although individuals who reported having lung problems were significantly less likely than others to intend to exercise and less likely to be actively engaged in an exercise program. Those who reported having diabetes closely mirrored the exercise behavior of those with lung problems; this result straddled significance (chi-square p=.059; point biserial p<.01).

The final factor predicting the stage of change for exercise behavior was children: those with no children under the age of 18 in the household were significantly more likely than those with children to be exercising currently and to be intending to exercise.

Rate of exercise counseling. Sixty percent of the respondents reported that their health care providers had discussed exercise with them at least once, but this appeared to have no relationship to the reported stage of change.

Barriers and motivations. The most frequently reported barriers for people who were not exercising were lack of access to equipment, lack of time, and cost (Table 5). The most important motivations for people who intend to exercise were feeling more comfortable with their body, improving overall health, and lowering the risk of heart attack (Table 6). Similarly, the most important motivations for people who currently exercise were improving overall health, lowering the risk of heart attack, and feeling better about themselves (Table 6).

Table 5.

BARRIERS FOR PATIENTS WHO DO NOT EXERCISE (PRECONTEMPLATION, CONTEMPLATION AND PREPARATION) N=60

Item	Average rating[a]	Rank
I don't have access to exercise equipment.	2.78	1
I don't have time to exercise.	2.67	2
Exercising costs too much money.	2.50	3
I can't exercise because of my general health.	2.22	4
I don't have anyone to exercise with.	2.22	4
I don't know anyone who exercises.	2.08	6
I can't exercise because of a specific medical condition.	2.05	7
I feel uncomfortable or embarrassed in exercise clothes.	2.00	8
I get enough exercise at work.	1.93	9
I don't feel safe exercising outside in my neighborhood.	1.85	10
I would feel embarrassed if people saw me exercising.	1.73	11
I don't believe that exercise makes you healthier.	1.71	12
There is too much I would have to learn to exercise.	1.55	13
Exercise puts an extra burden on my significant other.	1.33	14
Exercise prevents me from spending time with my friends.	1.32	15
Exercise makes me too sweaty.	1.24	16

[a]Importance to the person in describing why they do not exercise now (1=not important through 5=extremely important).

Discussion

Respondents in the present sample fell into the action and maintenance stages at a rate similar to other U.S. populations, although we had hypothesized that the medically underserved would be exercising at lower rates than the general population. As expected, the proportion of respondents in this study who reported that they intend to exercise is lower, and the proportion reporting that they do not intend to exercise is slightly higher, than other U.S. populations. These results may arise from the relatively liberal definition of exercise used in our study (three times a week for 20 minutes each time versus a more rigorous definition of 30 minutes most days of the week).[25,28]

This study identified three predictors of exercise among underserved patients: 1) men are more likely than women to exercise; 2) those with lung problems or diabetes are less likely than others to exercise or to intend to do so; and 3) those with children under the age of 18 in the household are less likely than others to exercise currently or to intend to exercise. Race, marital status, smoking status, employment status, and the presence of other chronic problems (high blood pres-

Table 6.

PATIENT MOTIVATIONS, INTENDING TO EXERCISE VS. EXERCISE

	Motivations for patients intending to exercise (contemplation and preparation) n=20		Motivations for patients who exercise (action and maintenance) n=58	
Item	**Average rating[a]**	**Rank**	**Average rating[a]**	**Rank**
I would feel/feel more comfortable with my body if/because I exercise(d) regularly.	4.65	1	3.66	9
Exercise would improve/improves my overall health.	4.60	2	4.12	1
Exercising would lower/lowers my risk of having a heart attack.	4.5	3	4.04	2
Exercising would help/helps me lose weight.	4.45	4	3.50	11
I would feel better/feel better about myself if/because I exercise(d).	4.35	5	4.00	3
Exercise helps prevent heart disease.	4.25	6		
Exercise helps prevent diseases like cancer and diabetes.	4.25	6	3.49	12
Exercise would help/helps keep me from gaining weight.	4.15	8	3.60	10
Regular exercise would help/helps me have a more positive outlook on life.	4.05	9	3.71	5
I would feel/feel less stressed if/because I exercise(d) regularly.	3.95	10	3.38	14
Exercising would set/sets a good example for my children.	3.85	11	3.67	8
Exercise would improve how I look.	3.80	12	3.77	4
Exercising would put/puts me in a better mood for the rest of the day.	3.65	13	3.69	7
My health care provider told me that it was important for me to exercise.	3.65	13	3.71	5
I would have/have more energy for my family and friends if/because I exercise(d) regularly.	3.55	15	3.47	13
Exercise would help/helps a specific medical condition I have.	3.25	16	3.35	15

[a]Importance to the person in describing why they do not exercise now (1=not important through 5=extremely).

sure and heart or joint problems) showed no relationship with exercise behavior or intent to exercise.

The barriers and motivations to exercise identified by the patients in our sample were consistent with those reported in the literature. Two of the top three motivations for those who intend to exercise and those who exercise are the same (*exercising improves (or would improve) my overall health* and *exercising lowers (or would lower) my risk of having a heart attack*). Successful physician intervention to motivate exercise among these patients may be enhanced if the intervention concentrated specifically on improving overall health and heart attack prevention. Among those who do not exercise, the most important barriers were lack of access, time, and money. Helping patients identify and develop avenues to overcome these barriers is paramount.

Patients in this study lacked sufficient health insurance and predominately were White women; in these respects, they differed from patients who participated in previously published studies regarding exercise. Further, 43% of the patients in our sample reported that they currently smoke; nationally, smoking rates are 12% for college graduates, 28% for high school graduates, and 35% for those with less than a high school education.[29] Based on self-reported height and weight, the average BMI for our sample was 30.85, which means that on average participants were obese according to Federal Obesity Guidelines, which identify overweight as a BMI of 25 to 29.9 and obesity as a BMI of 30 and above.[30] There appears to be a great need for exercise counseling among this population.

Although 60% of the underserved patients in this sample reported that their health care providers discussed exercise with them, it had no significant relationship with their intent to exercise or their current exercise behavior. There also was no relationship between patients' SF-12 scores for self-rated health and exercise behavior or intent.

According to the Federal Obesity Guidelines, the most successful strategies for weight loss include physical activity.[30] Prochaska and Velicer report that the majority of at-risk populations are not prepared for action and, therefore, will not be served well by traditional action-oriented interventions.[31] Improvements in movement through the stages of change occurs when health care providers use targeted interventions appropriate to the patient's stage of change.[32,33,34] In order to increase exercise among the medically underserved, interventions must consider: a) the patient's personal characteristics and health status, b) the patient's stage of readiness to change, and c) the barriers and motivations to exercise in this population.

There are limitations of the present study. First, although patients reported having discussions about exercise with their health care providers, nothing is known about the reason for the patient's visit, who initiated the discussion about exercise, the content of the discussion, or how recently the discussion occurred. Second, the reliability of the results depends on self-reported data regarding behaviors and intentions. However, there is no feasible way in which to collect this type of data reliably other than self-report, a method which is typically used for this type of research. Conducting face-to-face interviews rather than relying on a paper/pencil survey reduced potential bias due to low literacy levels. Finally, the generalizability

of results is limited by the relatively small sample size and the non-random convenience sample.

Conclusion

The delivery of preventive health care will require special efforts to target populations in which physical inactivity is particularly prevalent.[35] These groups include the socioeconomically disadvantaged and the less educated, people likely to be medically underserved. Interventions matched to an individual's stage of change have a greater effect than general education.[24] Identification of factors associated with the successful maintenance of healthy behaviors could positively influence future health promoting behavior interventions and render them more cost effective. Additional research in this area is imperative.

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