PERCEPTION OF GENERIC PRESCRIPTION DRUGS AND UTILIZATION OF GENERIC DRUG DISCOUNT PROGRAMS

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Objective: Our study aimed to assess patient's perceptions of generic drugs and utilization of generic drug discount programs.

Design, Setting and Participants: A survey was administered to adult participants at community health centers and community-based organizations in Houston, Texas, USA ($n=525$).

Main Outcome Measures: Multivariate logistic regression was used to quantify the strength of association between generic drug perception and utilization of generic drug discount programs.

Results: Respondents who agreed that ''Generic prescription drugs are as effective as brand name prescription drugs,'' were 3 times as likely to utilize generic drug discount programs (AOR: 3.0, 95% CI: 1.8–4.8, $P<.001$). Compared to non-Hispanic Whites, African Americans (OR: 10.2; 95% CI: 1.4–76.4) and Hispanics (OR: 10.3; 95% CI: 1.3–79.4) were 10 times as likely to agree that generic drugs have more side effects than brand name drugs.

Conclusion: Race/ethnicity had no impact in utilization of generic drug discount programs, despite racial disparities in perception toward generic drugs' side effects and generic drugs being inferior to brand name drugs. (*Ethn Dis.* 2012;22[4]:479–485)

Key Words: Generic Prescription Drugs, Prescription Drug Cost, Health Care Cost, Health Care Access

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INTRODUCTION

Pharmaceutical costs accounts for a significant proportion of US health care expenditures and rank third to hospital expenses and physician services.[1] The rising cost of prescription drugs is a concern and in the United States was $300 billion in 2008.[2] High out of pocket prescription drug cost is associated with medication nonadherence and adverse health outcomes,[3–6] and several studies have indicated cost-related prescription drug nonadherence.[7–13]

Increasing the use of generic prescription drugs may help curb the rising pharmaceutical cost without sacrificing the quality of health care.[1,2,9,14] Generic prescription drugs cost less and are bioequivalent to brand name drugs as they contain the same active ingredients but may differ in color, shape, size, and other non-active ingredients.[1,3,10,15–18] Generic drug discount programs (GDDP) may help reduce cost-related non-adherence. These programs are relatively new in the United States having been started by Wal-Mart in late 2006 and followed by several other retail outlets.[19–21] For the purpose of our study, GDDP is defined as a discounted program offered by retail pharmacy stores in which certain generic prescription drugs used to treat chronic illnesses are typically offered for $4 for a 30-day supply or $10 for a 90-day supply and other similar price variations. It is estimated that only 6% of adults are utilizing the $4 generic prescription drugs to fill their prescription and increase in utilization could save as much as $6 billion/year.[22]

Physicians do acknowledge that a sizable portion of their patients have difficulties paying for prescription drug costs.[2] While physicians feel it is important to discuss out-of-pocket prescription drug costs with patients, they seldom have such discussions with their patients.[23] Additionally many patients who underuse prescription drugs due to cost do not bother to communicate such information to their physician.[24] On the one hand some physicians agree that it is important to manage patients' out-of-pocket costs,[25,26] however, some physicians have expressed negative perceptions about the quality of generic prescription drugs.[2] Generic prescription drugs have been mistrusted in the past but are gaining wider acceptance.[9,27–30] Increasing the use of generic drug discount programs may improve access to essential prescription drugs, provide cost savings, and reduce prescription drug nonadherence and abandonment due to cost.

Patients have indicated that they will use generic prescription drugs if recommended by their physician or pharmacist.[27,30] Patients who have a positive perception and communicate their comfort with generic substitutions with their providers are more likely to utilize generic prescription drugs.[14] Additionally, cost considerations, effectiveness, and perceptions are likely to influence patients' decision to utilize generic prescription drugs.[31]

Minorities and individuals with less education have been found to have more negative attitudes toward generic prescription drugs.[1,7,27,30] Patients' perception of generic prescription drugs may impact how they are utilized; however, little is known about the effect of perception of generic prescription drugs on utilization of generic drug

Patients' perception of generic prescription drugs may impact how they are utilized; however, little is known about the effect of perception of generic prescription drugs on utilization of generic drug discount programs.

discount programs. The association between perception toward generic drugs and utilization of generic drug discount programs has not been evaluated and will be assessed in our study.

METHODS

Study Design and Participants

A survey was developed specifically for our study to determine perception and use of generic drug discount programs. The survey was pilot tested and administered to low-income participants in four neighborhoods (Sunnyside, Independence Heights, Bellaire, and Stafford neighborhoods) in Houston, Texas. We recruited participants from these neighborhoods through three community health centers, two multiservice centers, and two churches. A systematic sampling method with a random start was used.[32] The first participant at each location was selected by using a random number table.[33] Every fifth person thereafter was selected to participate in the survey if they met the eligibility criteria. We approached potential participants at the selected locations and provided a brief summary of the study purpose. If they agreed to participate we provided them the survey. We used the intercept survey method, in which the questionnaires were handed to participants, and participants completed the questionnaire and handed them back to the investigator. The investigator stored surveys in a brown manila envelope for security. The survey took approximately 20–30 minutes for participants to complete. Participants were compensated with a $10 gift card upon survey completion.

Inclusion criteria to participate in the survey were: 1) individual income $<$\$30,000/year; 2) age $\geq$18 years; 3) the ability to speak English; 4) the ability to read and write in English; and 5) having a chronic health condition requiring prescription medication or a family member with chronic condition requiring prescription medication. There were no exclusion criteria if participants met the inclusion criteria. The University of Texas MD Anderson Cancer Center's Institutional Review Board approved the study protocol. Informed consent was obtained from each participant prior to administering the survey.

Outcome Measures

To assess participants' utilization of generic prescription drugs, we used the survey item indicating whether a discounted generic prescription program had been utilized at least once in the past 12 months. The outcome variable was dichotomized with one level indicating no utilization and the other level indicating utilization at least once in the past 12 months. To assess participants' perceptions regarding generic prescription drugs, we used five survey items: 1) quality - "Generic prescription drugs are equal in quality as brand-name prescription drugs;" 2) side effects - "Generic prescription drugs have more side-effects compared to brand name prescription drugs;" 3) safety - "Generic prescription drugs are as safe as brand name prescription drugs;" 4) effectiveness - "Generic prescription drugs are as effective as brand name prescription drugs;" and 5) image - "Generic prescription drugs are inferior to brand name prescription drugs" as our outcome variables. The outcome variables were dichotomized by collapsing strongly and mildly agree responses on the five generic drug perception items.

Independent Variables

The primary independent variables in our study were those variables describing the participants' sociodemographic characteristics. Those variables included sex, age, race/ethnicity, marital status, household income, number of chronic conditions and number of prescription drugs used.

Construct Validity

The individual subscales for our questionnaire was examined by exploratory factor analysis using maximum likelihood estimation with orthogonal rotations in SPSS for Windows (release 17.0, SPSS Inc., Chicago, Illinois).[34] The specifications used in our analysis assumed normality and correlations among factors. Exploratory factor analyses were conducted in an iterative fashion, whereby items were removed one by one until a reasonable factor solution was created. Criteria used for identifying the final solution was based on eigenvalue greater than one, at least three items per factor, and all factor items sharing a similar conceptual meaning.[35] The Cronbach's alpha for the subscales ranged from .61 to .87.

Statistical Analysis

Descriptive statistics were used to summarize the distribution of patient sociodemographic characteristics and questionnaire responses. The first logistic regression analysis was used to assess the relationship between utilization of generic drug discount programs and participant characteristics. Odds ratio estimates and 95% CI were reported. The second logistic regression analysis was used to assess the relationship between participants' perceptions regarding generic prescription drugs and participant characteristics. The dependent variables for the logistic regression analysis were the five survey items that measured

Table 1. Participant characteristics and utilization of generic drug discount programs

Characteristics	*n* (%)[a]	OR	95% CI	*P*
Sex				
Male	120 (23.1)	Ref		
Female	400 (76.9)	1.6	(1.1, 2.5)	.018
Age				
18–30	167 (31.8)	Ref		
31–40	110 (21.0)	1.5	(.9, 2.4)	.095
41–50	101 (19.2)	1.7	(1.0, 2.8)	.033
51–64	85 (16.2)	3.8	(2.1, 6.8)	<.001
≥65	62 (11.8)	4.1	(2.1, 8.1)	<.001
Race/ethnicity				
White	23 (4.4)	Ref		
African American	349 (66.7)	.9	(.4, 2.2)	.841
Hispanic	119 (22.8)	1.5	(.6, 3.7)	.404
Asian	32 (6.1)	.8	(.3, 2.4)	.708
Marital status				
Single	307 (62.7)	Ref		
Married	183 (37.3)	2.3	(1.5, 3.4)	<.001
Household income				
<$10,000	207 (42.3)	Ref		
$10,001–$20,000	117 (23.9)	1.4	(.9, 2.3)	.130
$20,001–$30,000	165 (33.7)	1.8	(1.1, 2.7)	.009
Insurance				
Medicare/Medicaid/private insurance	304 (58.1)	Ref		
Cash/gold card/free care	220 (41.9)	.8	(.6, 1.1)	.219
Chronic conditions				
0	274 (52.2)	Ref		
1	148 (28.2)	2.0	(1.3, 3.0)	<.001
2	63 (12.0)	2.6	(1.4, 4.7)	.002
≥3	40 (7.6)	6.7	(2.5, 17.6)	<.001
Number of prescriptions				
0	165 (31.4)	Ref		
1	127 (24.2)	3.5	(2.2, 5.7)	<.001
2	111 (21.1)	5.1	(3.0, 8.6)	<.001
≥3	122 (23.2)	6.6	(3.9, 11.4)	<.001

[a]Column percentages are based on participants who answered the question which may be less than 525, the total number of surveys collected.
Ref, reference group; OR, odds ratio; CI, confidence interval.

perception toward generic drugs. Odds ratio estimates and 95% CI were reported. Statistical analyses were performed using Stata (StataCorp. 2009. Stata Statistical Software: Release 11. College Station, Texas: StataCorp LP.).

RESULTS

Frequency Analysis

Of the 642 surveys distributed, 525 were completed and returned, resulting in an 82% response rate. The majority of participants were female (77%), single (63%) and African American (67%) as shown in Table 1. Study participants earned <$30,000 per year and 58% had some form of health insurance. Almost half (48%) of the participants reported having one or more chronic conditions, and almost half (44%) of the participants reported taking two or more prescription drugs. We did not observe any significant differences by race/ethnicity regarding utilization of generic drug discount programs.

Respondents were comfortable with the quality of generic drugs. Approximately 75% of survey participants reported that they strongly (48.9%) or mildly (26.4%) agreed with the statement, ''Generic prescription drugs are equal in quality as brand name prescription drugs,'' while 7% mildly or strongly disagreed. Respondents had difficulty assessing whether generic drugs had more side effects compared to brand name drugs. Approximately 30% of survey participants reported that they strongly (16.4%) or mildly (13.2%) agreed with the statement, ''Generic prescription drugs have more side effects compared to brand name drugs,'' while 24% mildly (6.3%) or

strongly (18%) disagreed, and 46% were undecided. Respondents were comfortable with the safety of generic drugs. Approximately 74% of survey participants reported that they strongly (51.8%) or mildly (22.2%) agreed with the statement, ''Generic prescription drugs are as safe as brand name prescription drugs,'' while 3% mildly or strongly disagreed. The majority of respondents perceived generic drugs as effective. Approximately 73% of survey participants reported that they strongly (46%) or mildly (26.9%) agreed with the statement, ''Generic prescription drugs are as effective as brand name prescription drugs,'' while 6% mildly or strongly disagreed. Approximately 36% of survey participants reported that they strongly (15.9%) or mildly (19.7%) agreed with the statement, ''Generic prescription drugs are inferior to brand name prescription drugs,'' while 30% mildly (15.1%) or strongly (15.1%) disagreed, and 34% were undecided.

Perceptions about Generic Drugs and Utilization of Generic Drug Discount Programs

In multivariate logistic regression analyses, after adjusting for sex, age, marital status, income, chronic conditions, and number of prescription drugs used, respondents who reported that they strongly or mildly agreed with the statement, ''Generic prescription drugs are as effective as brand name prescription drugs,'' were 3 times as likely to utilize the generic drug discount program (AOR: 3.0, 95% CI: 1.8–4.8, $P<.001$). Respondents who reported that they strongly or mildly agreed with the statement, ''Generic prescription drugs are as safe as brand name prescription drugs,'' were 2.5 times as likely to utilize the generic drug discount program (AOR: 2.5, 95% CI: 1.5–4.0, $P<.001$). Respondents who reported that they strongly or mildly agreed with the statement, ''Generic prescription drugs are equal in quality as brand name prescription drugs,'' were 2.3 times as likely to utilize the generic drug discount program (AOR: 2.3, 95% CI: 1.4–3.8, $P<.001$). Respondents who reported that they strongly or mildly agreed with the statement, ''Generic Prescription drugs have more side effects compared to brand name prescription drugs,'' were 1.7 times as likely to utilize the generic drug discount program (AOR: 1.7, 95% CI: 1.1–2.8, $P=.027$). Finally, the weakest association with utilizing the generic drug discount program were respondents who reported that they strongly or mildly agreed with the statement, ''Generic prescription drugs are inferior to brand name prescription drugs'' adjusted odds ratio (AOR:1.1, 95% CI: .7–1.8, $P=.644$).

Participants' Characteristics and Perceptions of Generic Drugs

Compared to non-Hispanic Whites (Table 2) African Americans (OR: 10.2; 95% CI: 1.4–76.4) and Hispanics (OR: 10.3; 95% CI: 1.3–79.4) were 10 times as likely, and Asians (OR: 4.9; 95% CI: .6–43.7) were 5 times as likely to strongly agree or mildly agree that generic drugs had more side-effects compared to brand name prescription drugs. Additionally, compared to non-Hispanic Whites, African Americans (OR: 3.9; 95% CI: 1.3–13.5) and Hispanics (OR: 3.9; 95% CI: 1.1–13.9) were 4 times as likely, and Asians (OR: 2.8; 95% CI: .7–11.5) were almost 3 times as likely to strongly agree or mildly agree that generic drugs were inferior to brand name prescription drugs.

DISCUSSION

To our knowledge, our study is the first to evaluate consumers' perception of generic prescription drugs and utilization of generic drug discount programs. Our study findings indicate that there were no significant differences by race/ethnicity regarding utilization of generic drug discount programs. However, negative perceptions regarding generic prescription drugs side effects and inferiority were more pronounced among the minority groups compared to Whites.

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In a study by Shrank et al,[9] they surveyed a sample of 2500 commercially insured beneficiaries of a large, national pharmacy benefits manager. That study population was mostly White, compared to our study participants who were mostly African American women. In that study a few respondents (10%) believed that generic drugs caused more side effects; this is similar to views expressed by our participants although at a higher rate of 30%. In another study, Portugese participants believed that generic medicines were effective and similar to their brand equivalents; this is consistent with views expressed by our participants.[36] In a study of diabetes patients, Piette et al found that African Americans compared to Whites consistently had higher negative views on several dimensions of beliefs about generic drugs.[37] Our study and theirs included the dimension of safety and effectiveness of generic drugs. In our study African Americans were more likely to have a negative perception regarding generic prescription drugs (with respect to side effects and inferiority of the drug) compared to Whites. Piette's study involved only African Americans and Whites; our study also included Hispanics and Asians. In a

Table 2. Survey participant characteristics and perceptions regarding generic drugs

Characteristics	Generic drugs are equal in quality as brand name prescription drugs		Generic drugs have more side effects compared to brand name prescription drugs		Generic drugs are as safe as brand name prescription drugs		Generic drugs are as effective as brand name prescription drugs		Generic drugs are inferior to brand name prescription drugs	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sex										
Male	Ref		Ref		Ref		Ref		Ref	
Female	1.37	(.87, 2.17)	.97	(.62, 1.51)	1.38	(.88, 2.17)	1.50	(.96, 2.33)	1.15	(.74, 1.76)
Age										
18–30	Ref		Ref		Ref		Ref		Ref	
31–40	1.63	(.92, 2.89)	1.05	(.60, 1.82)	1.36	(.79, 2.35)	1.58	(.91, 2.75)	.81	(.49, 1.36)
41–50	1.22	(.69, 2.14)	1.55	(.91, 2.66)	1.00	(.59, 1.71)	1.14	(.66, 1.96)	1.09	(.65, 1.83)
51–64	1.41	(.77, 2.60)	1.36	(.77, 2.42)	2.07[a]	(1.08, 3.96)	1.33	(.74, 2.39)	.76	(.43, 1.33)
≥65	1.25	(.64, 2.44)	1.61	(.86, 3.02)	1.81	(.89, 3.69)	1.75	(.88, 3.50)	1.76	(.97, 3.18)
Race/Ethnicity										
White	Ref		Ref		Ref		Ref		Ref	
African American	.96	(.37, 2.52)	10.2[a]	(1.35, 76.4)	.90	(.34, 2.34)	1.64	(.69, 3.91)	3.94[a]	(1.15, 13.5)
Hispanic	1.54	(.54, 4.36)	10.3[a]	(1.34, 79.4)	1.26	(.45, 3.53)	2.00	(.78, 5.09)	3.91[a]	(1.10, 13.9)
Asian/Other	1.15	(.34, 3.89)	4.89	(.55, 43.7)	1.65	(.46, 5.94)	3.00	(.89, 10.1)	2.78	(.67, 11.5)
Marital Status										
Single	Ref		Ref		Ref		Ref		Ref	
Married	1.07	(.70, 1.66)	1.33	(.90, 1.98)	1.40	(.91, 2.16)	1.40	(.91, 2.14)	1.13	(.77, 1.66)
Household income										
<$10,000	Ref		Ref		Ref		Ref		Ref	
$10,000 to $20,000	1.27	(.75, 2.13)	1.06	(.65, 1.75)	.81	(.49, 1.33)	1.31	(.80, 2.15)	.99	(.62, 1.59)
$20,000 to $30,000	1.50	(.93, 2.43)	1.19	(.76, 1.86)	1.38	(.85, 2.23)	2.22[a]	(1.37, 3.62)	.96	(.63, 1.47)
Chronic conditions										
0	Ref		Ref		Ref		Ref		Ref	
1	1.51	(.93, 2.46)	1.40	(.90, 2.16)	1.90[a]	(1.16, 3.11)	1.75[a]	(1.08, 2.85)	1.55[a]	(1.02, 2.35)
2	.91	(.49, 1.67)	1.03	(.56, 1.91)	.98	(.54, 1.79)	.77	(.43, 1.37)	1.27	(.72, 2.26)
≥3	1.49	(.66, 3.38)	2.06[a]	(1.04, 4.08)	1.46	(.67, 3.21)	.96	(.47, 1.99)	1.71	(.86, 3.38)
Number of prescription drugs used										
0	Ref		Ref		Ref		Ref		Ref	
1	1.34	(.79, 2.27)	1.31	(.76, 2.26)	1.44	(.85, 2.42)	1.40	(.84, 2.36)	2.13[a]	(1.28, 3.53)
2	1.41	(.80, 2.46)	2.16[a]	(1.26, 3.69)	1.43	(.83, 2.46)	1.70	(.97, 2.96)	2.12[a]	(1.26, 3.58)
≥3	1.51	(.87, 2.62)	2.23[a]	(1.32, 3.76)	1.71[a]	(1.00, 2.95)	1.28	(.76, 2.14)	2.52[a]	(1.52, 4.18)

[a]OR with $P<.05$.

study by Iosifescu et al, of adults aged ≥65 enrolled in Medicare, negative beliefs about generics were associated with being African American, lower education and income.[7] In our study, education was not a significant predictor, but African Americans were more likely to have a negative perception regarding generic prescription drugs (with respect to side effects and inferiority of the drug) compared to Whites. In another study of pharmacy patients in Auckland, New Zealand, the researchers found consumers' knowledge and understanding of generic medicine to be low and that consumers generally had a negative attitude toward generic medicine.[18] In our study, minorities were more likely to have a negative perception regarding generic prescription drugs (with respect to side-effects and inferiority of the drug) compared to Whites.

In our study, frequency analysis indicated that there was a high uncertainty regarding the side effects of generic prescription drugs (46% were undecided), and whether generic prescription drugs were inferior compared to brand name drugs (34% were undecided). Better communication by physicians and pharmacists to patients about equivalence of generic and brand name prescription drugs will increase generic prescription drug use,[27,30] make prescription drugs more accessible and affordable, and reduce the rising prescription drug cost.[37]

In our study, participants had a positive perception of the safety, quality

and effectiveness of generic prescription drugs. Generic prescription drugs greatly reduce the patients' out-of-pocket expenses, which in turn may facilitate prescription drug adherence.[2,25,38]

Compared to non-Hispanic Whites, minorities (African Americans, Hispanics and Asians) in our study were more likely to perceive that generic prescription drugs have more side effects and that generic prescription drugs were inferior compared to brand name prescription drugs. Patient education has been shown to increase acceptability of generic prescription drugs.[7,17] Educational programs improving the image of generic drugs targeted toward the minority population in the United States would help improve appropriate utilization of generic prescription drugs.

It should be noted that this was a cross-sectional study. The survey was conducted only in English and therefore may have excluded some potential participants who could not read or write in English. Our study consisted of mostly African American women. Further studies should be conducted that are more representative of the general population. The information provided in the survey was self-reported and has the same limitations inherent in all self-reported data. Further studies are needed to determine why some minority groups have negative perceptions of generic drugs with respect to side-effects and inferiority of generic prescription drugs compared to brand name prescription drugs.

In our study participants surveyed embraced generic drug discount programs although there were racial/ethnic disparities in perception toward generic prescription drugs side effects and generic prescription drugs being inferior to brand name prescription drugs. Race/ethnicity had no impact in utilization of generic drug discount programs. The effectiveness of generic prescription drugs stimulated the highest odds for utilization of generic drug discount programs compared to safety, quality, and side effects.

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