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Predictors of \$4 Generic Prescription Drug Discount Programs use in the Low-income Population

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Abstract

Background—Generic drug discount programs (GDDPs) are an option to provide affordable prescription medication to low-income individuals. However, the factors that influence the use of GDDPs in low-income population are unknown.

Objectives—To evaluate factors associated with utilization of generic a drug discount program in a low-income population.

Methods—A survey was administered to adult participants at health centers and community based organizations in Houston, Texas, USA (n=525). Exploratory factor analysis was conducted to determine the construct validity of the survey instrument and to assess distinct factors associated with GDDP utilization. Descriptive statistics were used to summarize the distribution of patient socio-demographic characteristics and questionnaire responses. Multivariate logistic regression was used to compute adjusted odds ratios and to examine the strength of association with GDDP utilization after adjusting for participant socio-demographic features that were statistically significant at a priori level of $p < 0.05$.

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Results—In this study, 72% of respondents were aware of the GDDP, and 61% had utilized the GDDP. Participants were 4 times likely to use a GDDP when their physician (AOR: 4.0, 95% CI: 2.6 – 6.4, $P < 0.001$) or pharmacist (AOR: 4.0, 95% CI: 2.6 – 6.3, $P < 0.001$) talked to them about it. Participants indicated that the most important barriers to utilization of GDDPs were lack of awareness (44%), and lack of recommendation by a physician (19%).

Conclusions—Increased patient awareness and physician recommendation may increase the use of GDDPs, which may lead to improved compliance with medications, better health outcomes and reduced health care costs.

INTRODUCTION

Generic prescription drug discount programs were first introduced by Wal-Mart in late 2006 and later followed by several retail outlets.¹ The high costs of prescription drugs may pose a financial burden for many individuals earning <\$30,000/year. High out-of-pocket prescription medication costs can affect medication adherence because some patients ultimately do not take the medication as prescribed or do not fill the prescription.² Results from a study by the Center for Studying Health System Change (HSC) showed that those with low incomes, chronic conditions, and/or no health insurance face the greatest unmet needs for prescription drugs.³ Overall, an uninsured patient is three times more likely not to fill a prescription than an insured patient.⁴

Evidence suggests that reduced rates of medication use among low-income individuals with chronic diseases may result from prohibitive drug cost and there is a corresponding association between medication underuse and adverse health outcomes.^{5–7} Underuse of prescription medication because of its high cost has been associated with negative health consequences, increased emergency room visits, and unnecessary hospitalizations.^{2,6–11}

Evidence suggests that patients who decrease their use of prescribed drugs due to high cost had higher rates of hospitalization and death.¹² Overall, medication non-adherence for various reasons has been linked to over 100,000 deaths, and total estimated direct and indirect costs exceeding \$100 billion annually, when lost productivity was factored.¹³

Because of increased drug costs, many chronically ill patients are not filling their prescription drugs and are at increased risk for morbidity and mortality.⁴ Worsening of their conditions may lead to more expensive health care resource utilization, such as emergency room visits or hospitalization.⁴ There is a need for managing chronic illness efficiently with prescription drugs; this need may be partially fulfilled by the use of a generic drug discount program (GDDP). For the purpose of our study, a 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 or similar price variations.

The factors that influence the use of GDDP are unknown, especially in low income population. The purpose of this study was to better understand factors that influence the use of GDDPs offered by pharmacy stores such as Kroger, Randalls, Target, Walmart, HEB, CVS, and Walgreens (CVS offers 90-day generic prescriptions for \$9.99, and Walgreens offers 90-day generic prescriptions for \$12.99) in low income population.

METHODS

Study setting and recruitment

A survey was developed specifically for this study to determine awareness and use of GDDP and was administered to low-income participants at four neighborhoods (Sunnyside,

Independence Heights, Bellaire, and Stafford) in Houston, Texas, USA. Participants were recruited from the four neighborhoods with the help of local churches, community health centers, and community-based organizations. Inclusion criteria to participate in the survey included the following: 1) Individual income less than \$30,000/year, 2) 18 years old, 3) the ability to speak English, 4) the ability to read and write in English, 5) having a chronic health condition requiring prescription medication or a family member with chronic condition requiring prescription medication. 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.

Instrument development

Face validity—The survey instrument was developed by the authors specifically for this study. The survey was developed out of a need to understand factors associated with low cost generic prescription drug discount program awareness and utilization. The survey questionnaire was developed concurrently with a focus group study, literature review, and marketing materials provided by retail pharmacies.¹⁴ The discount prescription drug program refers to the \$4 generic prescription drug for a 30-day supply and \$10 for a 90-day supply offered by pharmacy stores such as Kroger, Randalls, Target, Walmart, HEB, CVS, and Walgreens. Prior to its administration, the survey was pilot-tested among 30 randomly selected individuals from the target population. Feedback gathered from the pilot test was used to finalize the instrument. The Flesch-Kincaid Grade level and the Flesch Reading Ease of the 32 non-demographic items selected was 8.5 and 56%, respectively (Microsoft Word 2007, Microsoft Corporation, Redmond, WA).

Data collection

Participants were randomly selected using a systematic random sampling method with a random starting point and a fixed periodic interval.¹⁵ The first participant at each location was selected by using a random number table.¹⁶ Every fifth person thereafter was selected to participate in the survey if they met the eligibility criteria. Potential participants were approached at the study locations and provided a brief summary of the study purpose. If subjects agreed to participate they were provided the survey. The survey was conducted over a one-month period at the following locations: Greater St. Paul MBC Church (41 participants); Sunnyside Multi-Service Center (74 participants); Sunnyside Community Center (27 participants); True Light MBC Church (28 participants); Hope Clinic (Federal Qualified Health Center serving low-income, 100 participants); Independence Heights Community Health Center (Federal Qualified Health Center serving low-income, 103 participants); Second Mile Mission Center (provides food and clothing to homeless and low-income population, 51 participants) and Central Care Community Health Center (Federal Qualified Health Center serving low-income, 101 participants). The survey took approximately 20–30 minutes for participants to complete. Participants were compensated with a \$10 gift certificate upon survey completion.

Data analysis

Descriptive statistics were used to summarize the distribution of patient socio-demographic characteristics and questionnaire responses. Logistic regression was used to quantify the strength of association with GDDP utilization. The outcome variable for the logistic regression analysis was a dichotomous variable indicating whether a GDDP had been utilized at least once in the past 12 months. Odds ratio estimates and 95% confidence intervals are reported. Multivariate logistic regression was used to compute adjusted odds ratios and to examine the strength of association with GDDP utilization after adjusting for

participant socio-demographic features that were statistically significant at a priori level of $p < 0.05$.

Construct validity—The individual subscales for our questionnaire was examined by exploratory factor analysis (EFA) using maximum likelihood estimation with an orthogonal rotations in SPSS for Windows (release 17.0, SPSS Inc., Chicago, Illinois).¹⁷ The specifications used in the 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 were based on an eigenvalue greater than one, at least three items per factor, simple structure (items loading high on one factor and low on other), and all factor items sharing a similar conceptual meaning.¹⁸ The Cronbach's alpha for the subscales ranged from 0.61 to 0.87.¹⁹

Exploratory factor analysis—The association between factors and utilizations adjusted for covariates (i.e., demographic variables significant in bivariate models) was examined. To facilitate examining the associations between factors identified in the exploratory factor analysis (EFA) and GDDP utilizations, each factor was coded as a binary or dichotomous variable. That is, participants scoring in the low range of each factor (i.e., strongly/mildly agree or strongly/mildly disagree for negative worded questions) were coded separately from those scoring in the mid or high range (undecided or disagree). Statistical analyses were performed using Stata (StataCorp. 2009. Stata Statistical Software: Release 11. College Station, TX: StataCorp LP.)

RESULTS

Of the 642 surveys distributed, 525 were completed and returned, resulting in an 82 % response rate. The majority of participants were female (77%), and 67% were African American as shown in Table 1. Self-reported income data indicated that 42% of the study participants earned less than \$10,000/yr. Almost half (48%) of the participants reported having one or more chronic conditions, and a third (30%) of the participants reported taking three or more prescription drugs.

In this study 72% were aware of the GDDP, and 61% had utilized the GDDP at least once in the preceding 12 months. When asked about the decision to fill prescriptions with GDDPs 39% of participants indicated that they made the decision to utilize the GDDP, 23% indicated that their doctor recommended the GDDP, and 11% indicated that their pharmacist had recommended the GDDP. Twenty-six percent found out about the GDDP from family or friends, 21% from a pharmacist, 17% from a physician, and 10% from a television advertisement. Sixty-seven percent indicated that GDDPs have the potential to save elderly persons money during the Medicare Part D prescription coverage gap, and 63% of participants who used a GDDP indicated that such use positively affected their health. Participants indicated that the most important barriers to utilization of GDDPs were lack of awareness (44%), lack of recommendation by a physician (19%), lack of access to a physician (12%), generic medication not covered (12%), and lack of a nearby pharmacy (5%).

Factors associated with utilization of GDDP

This study identified several demographic factors (Table 1) that were associated with utilization of GDDPs. Women were 1.6 times more likely to utilize GDDP than men. As participant age increased, so did their likelihood of using GDDPs, with people 65 years old being 4 times more likely to use them than people 18–30 years old. Married participants

were 2.3 times more likely to use GDDPs than were unmarried participants. Participants earning \$20,000-\$30,000/year were 1.8 times more likely to utilize GDDPs than participants earning \$10,000/year. Participants having three or more chronic conditions and taking 3 or more prescriptions were 6 times more likely to use GDDPs. A person's race and ethnicity, level of education, employment status, and type of insurance did not have a statistically significant association with utilization of GDDPs.

Table 2 provides a list of adjusted odds ratios associated with GDDP utilization (adjusted for gender, age, marital status, income, chronic conditions, and number of prescription drugs used) from the multivariate logistic regression analysis. Participants with a high level of awareness of GDDP were 5 times more likely to utilize it. When a doctor or pharmacist had discussed a GDDP, participants were 4 times more likely to use one. Participants who felt the formulary should be expanded were 5 times as likely to utilize a GDDP than participants who did not feel this way, and participants who felt the program was easy to use were 5 times as likely to utilize it. Additionally, participants who felt they were treated with courtesy when they picked up their prescription at the pharmacy were 10 times more likely to use GDDPs, and participants who felt that the GDDP made a positive impact on their health were 6 times more likely to use it.

Factors not strongly associated with high GDDP use were: perceiving generic drugs to be inferior to brand-name drugs, perceiving generic drugs to have more side effects than brand-name drugs, and wishing their doctor had discussed their medication options with them. Finally, participants who felt that the \$20 annual enrollment fee charged by a GDDP was a barrier were less likely to use the service.

Factor analysis

Out of the 30 items selected for the initial factor solution, 19 items were retained, resulting in a total of 5 identified factors (Table 3). The five factors accounted for 65.4% of the variance. The five factors were named according to the conceptual meaning related to the items: positive perception of generics, awareness of GDDP and value, formulary and impact on seniors, communication with doctor or pharmacist, and negative perception of generics.

Internal consistency and factor correlations

The internal consistency of the scales was estimated by computing Cronbach's alpha coefficients. The descriptive for each subscale is included in Table 4. The subscales appeared to be normally distributed with appropriate skewness and kurtosis values. The Cronbach's alpha for the subscales ranged from 0.61 to 0.87. The awareness and value subscale was significant and significantly correlated with positive perceptions about generics ($r = 0.50, p < 0.01$), formulary and impact on seniors ($r = 0.30, p < 0.01$), and communication with doctor or pharmacist ($r = 0.42, p < 0.01$), but not negative perceptions of generics ($r = -0.03, p > 0.05$). Positive perceptions about generics was significantly and positively associated with formulary and impact on seniors ($r = 0.46, p < 0.01$) and communication with doctor or pharmacist ($r = 0.40, p < 0.01$), but not negative perceptions of generics.

DISCUSSION

This study found that higher numbers of chronic conditions and higher numbers of prescription medications were associated with increased utilization of GDDPs. Having more chronic conditions increased the likelihood of participants having to take more prescriptions. Both variables have the potential to increase out-of-pocket expenses for participants, thus making them more likely to utilize a GDDP because of its affordability and the opportunity

to save money. As participant's age increased, so did their use of GDDP. The reason for this is probably because people tend to have more chronic conditions as they get older, requiring increased use of prescribed medication.

Participants who earned \$20,000–\$30,000 were 2 times more likely to utilize GDDPs, possibly because they were more aware of GDDP and had more resources available to facilitate their use of GDDPs compared to their counterparts that earned less. When doctors and pharmacists discussed GDDPs with participants, it greatly influenced participants' decision to utilize GDDP. However, 39% decided on their own to utilize the GDDP; 23% decided based on recommendation from a physician, and 11% decided based on recommendation from a pharmacist.

Several study participants expressed interest in using GDDP but had previously been unaware of such programs, thus more awareness of GDDP is needed. In addition, there were several participants who would have liked to use a GDDP, but their generic medications may not be on the list of covered medication; thus there is a need to expand the number and type of drugs covered by the GDDP.²⁰ Participants who reported being treated with courtesy when they picked up their prescription were 10 times more likely to utilize a GDDP. It was surprising to find out that courtesy had the highest odds ratio. This is probably a reflection of what study participants valued.

Some strengths of using GDDPs are that they are user-friendly, there is no paperwork to complete, no billing of patients or insurance is required, no income verification is required unlike some of the prescription assistance programs. Some weaknesses of GDDPs use are that the formulary of covered medication is limited (300 – 400 medications, different doses of the same medication are each counted as an individual medication), and patients and physicians are not aware of GDDPs as they should due to inadequate marketing.^{20,21}

To increase use of GDDPs, physicians should recommend GDDP to their patients when appropriate. GDDPs may be beneficial to most patients who can afford to pay between \$4 and \$12.99 for a 30-day or 90-day supply of generic prescription medication regardless of health insurance status. Additionally, pharmacy chains that offer GDDPs are rather pervasive in most areas of the U.S. Patients' abilities to afford their prescribed medications should be considered by physicians during patient visits. It may be beneficial if this discussion occurs between the physician and patient before medication is prescribed. This may improve patient medication adherence and health outcomes.

Limitations

It should be noted that this was a cross-sectional study. The results should be interpreted within the context of the population surveyed. The limited geographic scope of the survey precludes drawing conclusions regarding the policy implications of the research. Survey participants were mostly low-income minority women earning less than \$30,000/yr. However, a person's race or ethnicity did not have a statistically significant association with utilization of GDDP. The low-income neighborhoods influenced to some extent the racial/ethnic composition of survey participants, although no significant differences were observed by location. Future studies are needed with participants with similar proportions of the national race/ethnic composition. The information provided in the survey was self-reported and has the same limitations inherent in all self-reported data. The survey was conducted only in English and therefore may have excluded some potential participants who could not read or write in English. In addition, exploratory factor analysis only provides initial evidence of construct validity, and further adaptation and validation of this survey instrument is warranted.

There are many generic drugs that participants might prefer to be on the GDDP formulary that currently are not. Aside from obvious cost considerations, the mechanism and criteria by which a pharmacy organization makes GDDP formulary decisions is not known.

CONCLUSION

GDDPs may serve as a means of resolving underuse of some prescribed medications in low-income populations. Treating patients with courtesy may increase the use of GDDP and may lead to improved health and reduced health care costs. A need exists for expanded drug formularies and educational interventions that improve awareness of GDDP for low-income patients; such interventions could enhance the frequency with which patients talk with their physicians and allow them to make more informed decisions about generic drugs and the appropriateness of generic prescription drugs for their particular illness or health condition.

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Table 1

Participant characteristics and likelihood of GDDP use

Characteristics	n (%) *	OR	95% CI	P-value
Gender				
Male	120 (23.1%)	Ref		
Female	400 (76.9%)	1.6	(1.1, 2.5)	0.018
Age				
18–30	167 (31.8%)	Ref		
31–40	110 (21.0%)	1.5	(0.9, 2.4)	0.095
41–50	101 (19.2%)	1.7	(1.0, 2.8)	0.033
51–64	85 (16.2%)	3.8	(2.1, 6.8)	< 0.001
65	62 (11.8%)	4.1	(2.1, 8.1)	< 0.001
Race				
White	23 (4.4%)	Ref		
African American	349 (66.7%)	0.9	(0.4, 2.2)	0.841
Hispanic	119 (22.8%)	1.5	(0.6, 3.7)	0.404
Asian	32 (6.1%)	0.8	(0.3, 2.4)	0.708
Marital status				
Single	307 (62.7%)	Ref		
Married	183 (37.3%)	2.3	(1.5, 3.4)	< 0.001
Income				
<\$10,000	207 (42.3%)	Ref		
\$10,001–\$20,000	117 (23.9%)	1.4	(0.9, 2.3)	0.130
\$20,001–\$30,000	165 (33.7%)	1.8	(1.1, 2.7)	0.009
Education				
Less than high school	87 (16.6%)	Ref		
High school	175 (33.3%)	0.8	(0.4, 1.3)	0.337
Some college or beyond	263 (50.1%)	0.7	(0.4, 1.2)	0.248
Employment				
Full-time/part-time	282 (53.9%)	Ref		
Retired/student/unemployed	241 (46.1%)	1.0	(0.7, 1.5)	0.858
Insurance				
Medicare/Medicaid/private insurance	304 (58.1%)	Ref		
Cash/gold card/free care	220 (41.9%)	0.8	(0.6, 1.1)	0.219
Chronic conditions				
0	274 (52.2%)	Ref		
1	148 (28.2%)	2.0	(1.3, 3.0)	0.001
2	63 (12.0%)	2.6	(1.4, 4.7)	0.002
3	40 (7.6%)	6.7	(2.5, 17.6)	< 0.001
Number of prescriptions				

Characteristics	n (%) *	OR	95% CI	P-value
0	165 (31.4%)	Ref		
1	127 (24.2%)	3.5	(2.2, 5.7)	< 0.001
2	111 (21.1%)	5.1	(3.0, 8.6)	< 0.001
3	122 (23.2%)	6.6	(3.9, 11.4)	< 0.001

* 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

Table 2

Multivariate logistic regression analysis of other factors influencing GDDP utilization.

Factors	AOR*	95% CI	P value
Treated with courtesy by GDDP staff	10.6	(6.3, 17.8)	< 0.001
GDDP is helpful to participant	6.2	(3.6, 10.5)	< 0.001
GDDP made a positive impact on participant health	6.0	(3.8, 9.6)	< 0.001
Easy to use the GDDP service	5.3	(3.2, 8.7)	< 0.001
GDDP is a good value	5.1	(2.9, 8.8)	< 0.001
GDDP formulary needs to be expanded	5.1	(2.9, 8.9)	< 0.001
Awareness of GDDP	4.8	(2.9, 8.0)	< 0.001
GDDP saves the participant money	4.7	(2.7, 8.0)	< 0.001
Doctor talked about GDDP	4.0	(2.6, 6.4)	< 0.001
Pharmacist talked about GDDP	4.0	(2.6, 6.3)	< 0.001
Able to obtain prescription through a GDDP	3.9	(2.4, 6.3)	< 0.001
If pharmacist recommends generic drug participant would take it.	3.4	(1.8, 6.5)	< 0.001
Easy access to pharmacy offering a GDDP	3.2	(1.9, 5.1)	< 0.001
Generic drug is as effective as brand name	3.0	(1.8, 4.8)	< 0.001
If doctor recommends generic drug participant would take it.	2.7	(1.4, 5.3)	0.003
Generic drug is as safe as brand name	2.5	(1.5, 4.0)	< 0.001
Generic drug is equal in quality to brand name	2.3	(1.4, 3.8)	0.001
GDDP saves seniors money	2.3	(1.5, 3.7)	< 0.001
Generic drug have more side-effects than brand name	1.7	(1.1, 2.8)	0.027
\$10 annual enrollment fee is a barrier.	1.6	(1.0, 2.5)	0.032
Participant will like to discuss medication options with doctor.	1.5	(0.9, 2.5)	0.158
\$20 annual enrollment fee is a barrier.	1.3	(0.8, 2.0)	0.220
Generic drug is inferior to brand name	1.1	(0.7, 1.8)	0.644

* Adjusted odds ratio estimates represent the association between utilizing GDDP in the past 12 months and strongly or mildly agreeing with the survey item listed, while adjusting for gender, age, marital status, income, number of chronic conditions, and number of prescription drugs used.

Table 3

Exploratory factor analysis

	Positive Perception of Generics	Awareness of GDDP and value	Formulary and Impact on Seniors	Communication with doctor or pharmacist	Negative Perception of Generics
Awareness of GDDP	-.063	-.720	-.049	.001	.024
GDDP is helpful	.079	-.800	.032	.019	.003
GDDP saves money	.049	-.814	.049	-.048	-.071
GDDP is good value	.116	-.760	-.002	.036	.012
Generics are equal in quality to brand name	.638	-.038	-.063	-.024	-.014
Generics have more side-effects than brand name (Reversed scored)	.090	.091	.009	-.027	.682
Generics are as safe as brand name	.725	-.116	-.013	.055	-.024
Generics are as effective as brand name	.963	.041	.043	.026	-.022
Generics are inferior to brand name (Reversed scored)	-.035	.023	.025	.173	.631
Will use generics if pharmacist recommended	.512	-.044	-.068	-.160	.190
Comfortable asking doctor for generics	.548	-.040	-.103	-.094	.051
Able to obtain prescription	-.064	-.238	-.143	-.402	.050
Doctor talked about GDDP	.106	.056	.001	-.731	-.087
Pharmacist talked about GDDP	.017	.005	.046	-.833	-.018
Not able to obtain prescription (Reverse scored)	-.015	-.059	.002	-.034	.471
Need more medication on list	-.032	-.044	-.477	-.069	-.015
Expand formulary	.122	-.056	-.403	-.060	-.041
GDDP save seniors money	.009	.076	-.853	.033	.060
GDDP keep seniors healthy	.044	.026	-.860	.113	-.052
Eigenvalue	2.96	2.10	1.87	1.36	1.14
Explained variance (%)	31.4	11.1	9.8	7.1	6.0

Table 4

Internal consistency and correlations of exploratory factor analysis subscales

	Number of items	Range	Mean (SD)	Skewness	Kurtosis	Cronbach's Alpha	Odds Ratio (95% Confidence Interval)
Awareness of GDDP and value	5	4 – 18	6.4 (3.1)	1.375	1.328	0.86	4.78 (2.84, 8.04)
Positive perception of generics	4	5 – 25	8.7 (4.1)	1.423	2.267	0.87	3.28 (2.02, 5.33)
Formulary and impact on seniors	4	4 – 17	6.6 (2.9)	.970	.345	0.76	3.99 (2.40, 6.66)
Communication with doctor or pharmacist	3	3 – 15	6.8 (3.2)	.653	-.439	0.74	4.57 (2.87, 7.29)
Negative perceptions of generics	3	3 – 15	9.4 (3.1)	-.019	-.449	0.61	1.33 (0.85, 2.09)