Patient Adherence to Health Care Provider Recommendations and Medication among Free Clinic Patients

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Abstract

Patient adherence is vital for the quality of health care outcomes and treatment efficacy, and reduces the economic burden on the healthcare system. The purpose of this study was to examine factors associated with levels of general adherence among uninsured free clinic patients. This was a cross-sectional study using a convenience sample of free clinic patients aged 18 years and older who spoke English and/or Spanish. Descriptive statistics and multiple regression were performed to understand sociodemographic characteristics and factors associated with higher levels of general adherence. A higher level of general adherence were significantly associated with younger age ($P < .01$), levels of adherence to lifestyle recommendations ($P < .01$), and medication ($P < .01$). Having attended health education classes and having a primary care provider were not associated with levels of general adherence. This study suggested that a lower level of general adherence exists among elderly patients of the free clinic. In this light, providers need to consider unique strategies to enhance the provider-patient relationship by understanding patient's characteristics and providing sufficient information and explanation for treatment and medication.

Keywords

patient adherence, free clinics, uninsured patients, health outcome

Introduction

Patient adherence is essential for treatment efficacy and can be broadly understood as a patient's behavioral response to the health care provider's treatment recommendations and medication prescriptions (1,2). While patient adherence is most commonly assessed regarding medication, it also applies to healthcare providers' recommendations regarding behavioral characteristics such as self-care, diet, exercise, lifestyle changes, etc. (3). Patient nonadherence poses a significant economic burden both to the patient and to the health care system since a condition can progress and result in increased morbidity and mortality (4). Therefore, improving patients' general adherence to health providers' recommendations and medication regimens could prevent future adverse health outcomes and increased economic burden.

General adherence is defined as patients' tendency to adhere to clinical recommendations and treatment and it can be driven by many elements, including a patient's socioeconomic status, chronic conditions, provider-patients discordance, and healthcare access (2,5–).

Poverty plays an important role in nonadherence. Low socioeconomic status patients adhere less well to treatment and medication, on average, increasing their risk of morbidity and mortality (8). The prevalence of medication nonadherence is also higher among underserved populations (9). For example, lack of insurance and low income are directly related to a patient's medication nonadherence because patients may have difficulty paying for prescribed medicine (10,11).

In chronic conditions, poor general adherence may lead to adverse events. For example, when diabetic patients are not adherent to their medication regimen, causing their blood

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sugar level to be poorly controlled, they are predisposed to an increased risk of hyperglycemic episodes (12). Thus, the consequence of nonadherence often results in disease progression, more hospitalization, and ultimately, lower quality of life.

Talcott Parsons' description of "Sick Role" is an important perspective for understanding how physicians and patients should, ideally, interact (13). A previous study has shown that providers' role and relationships with patients are strongly related to how likely patients will follow their treatment plan to improve their health and accelerate recovery (14). In this study, we use Parsons' concept of the provider-patient relationship as a theoretical framework to help better understand patients' treatment needs and achieve patient adherence to a provider's treatment recommendation (15). The provider-patient relationship is an important component of health care delivery and treatment efficacy. The quality of provider-patient communication and patient-centered practice, including shared decision making and receiving feedback from patients on treatment goals, were shown to be among the key drivers of improved patients' general level of adherence and overall care (16,17).

Factors associated with patient adherence have been assessed in previous studies; however, the heterogeneous character of these existing studies has shown inconsistencies and discrepancies, indicating a need for further research (18). For example, while some studies have shown that medication adherence is high among patients below age 65, other publications have shown the opposite result: lower adherence among a younger population or no association between age and level of adherence (19,20). Therefore, it is important to conduct further analysis to understand better how age may influence patients' level of adherence.

Free clinics provide free or reduced-fee health services to patients who live in poverty (21). Most free clinic patients have chronic conditions such as hypertension or diabetes and tend to have unmet medical needs (22). Free clinic patients are an understudied population in terms of general adherence; only a few studies have examined the level of medication adherence (23). To improve the treatment and health outcomes, it is important for free clinics better to understand their patients' levels of general adherence. The purpose of this study was to examine factors associated with levels of general adherence among uninsured free clinic patients. The results of this study are expected to apply to other underserved populations whose patient adherence levels are not well known.

Methodology

Setting

This cross-sectional community-based study was approved by the Institutional Review Board and was conducted at a free clinic located in a metropolitan area. The clinic provides free medical services, including primary and preventative care, to individuals without health insurance who have a household income at or below 150% of the federal poverty level. More

than 50% of the clinic's patients are self-identify as Hispanic. The clinic is classified as a nonprofit organization and is mainly funded by nongovernmental grants and donations. The clinic started its operation in 2005 and is open five days a week with the support of 14 paid staff and over 500 volunteers.

Participants

Data were collected using a self-administered paper survey given at the clinic more than three times per week from August to December 2017. Participants were clinic patients aged 18 years old or older who spoke English and/or Spanish. All survey materials were available in English and Spanish. English materials were translated into Spanish by a bilingual translator. Another translator back translated the materials. The third translator verified the accuracy of the translation. Recruitment occurred during clinic business hours in the clinic waiting room area by research assistants from the research team. Since the method used s was a convenient sampling, a response rate was unknown. All potentially eligible patients in the waiting room were approached when a research assistant was present for survey collection.If a potential participant expressed interest, he or she received a consent cover letter and a self-administered survey instrument. Consent was obtained from each participant. Participants received a small gift (US$1 or less, e.g., toothbrush, kitchen towel) at the time of the completion of the survey. Research assistants were present to answer questions for the duration of the time participants were completing the survey.

Measures

General Adherence. This 5-item general adherence questionnaire was adopted from The Medical Outcomes Study (MOS) Measures of Patients Adherence (23). For each item, participants were asked to rate their general adherence to medical recommendations using the 6-point Likert scale (1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = a good bit of the time, 5 = most of the time, 6 = all the time). The total score was calculated by summing the individual items. Cronbach's alpha for this population is 0.67.

Specific Adherence Behavior. This 15-item scale questionnaire was adopted from The Medical Outcomes Study (MOS) Measures of Patients Adherence (23). Participants were asked to rate their adherence to specific treatment and behavior recommendations by their provider using a 7-point Likert scale (1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = a good bit of the time, 5 = most of the time, 6 = all of the time, 7 = not applicable). This measurement scale was added to minimize response bias to the general adherence scale. The total score was calculated by summing the individual items. Cronbach's alpha for this population is 0.92.

Adherence to Medications Scale. This 12-item scale question-naire was modified from the Adherence to Refills and Medications scale and has two subscales (24). Participants were asked to rate their adherence to medications and pre-scription refills using a 4-point Likert scale (1 = never, 2 = sometimes, 3 = most of the time, 4 = always). Questions in this scale were written in a way that a lower score indicated better adherence to medications. The total score was calcu-lated by summing the individual items. Cronbach's alpha for this population is 0.82.

Depression PHQ-9 Scale. Participants were asked to rate their depression using Patient Health Questionnaire (PHQ-9) (25). PHQ-9 is a reliable scale with 9-items using a 4-point Likert scale (0 = not at all, 3 = nearly every day). The total score was based on a sum of the scores on each item. Questions on this scale were written in a way that a higher score indi-cates higher levels of depression. The Cronbach alpha for this population is = 0.90

Self-Rated General Health. Participants were asked to rate their general health using a 5-point Likert scale (1 = excel-lent, 2 = very good, 3 = good, 4 = fair, 5 = poor). A lower score indicates better health.

Sociodemographic Characteristics. The following demographic questions were asked: age, gender, place of birth, race, eth-nicity, educational attainment, employment status, marital status, country of origin, length of years living in the United States (for non-US-born participants), and how long a participant had been a patient at the clinic.

Data Analysis

Data were analyzed using IBM SPSS, version 25.0. Descriptive statistics were used to present the characteristics of the free clinic participants and distributions of the varia-bles. Descriptive data was used to show the normality of our sample and were presented as percentages for categorical variables and as mean and standard deviation (SD) for con-tinuous variables. Multiple regression was performed using patient general adherence as a dependent variable. In addi-tion, participants were classified and analyzed in three groups using one-way analysis of variance (ANOVA). The following participant sociodemographic variables were included as independent variables: age, race, ethnicity, gender (male = 1, female = 2), whether participants were born in us or not (US-born = 1, non-US-born = 0), whether the participant was a patient of the clinic for more than two years or not (less than 2 years = 1; 2 years or longer = 2), edu-cational attainment, employment status, and marital status. In addition, depression, self-rated health, general adherence, specific adherence behavior related to lifestyle, and medica-tion adherence, were included as independent variables. Multicollinearity was tested using variance inflation factor

(VIF), and there was no significant multicollinearity among the variables.

Results

Table 1 describes the analytic summary of participants' soci-odemographic characteristics and total participant character-istics (N = 796). Approximately 36% of the total participants were females. US-born English speakers had the highest per-centage of females (*n* = 86, 45%; *P* < .05). The total number of participants who were self-identified as Hispanic/Latino/Latina was more than 60% (*n* = 493, 61.9%) and more than 70% of US-born English speakers were White-non-Hispanic (*n* = 134, 70.2%).

More than 44% of participants had some college or higher educational attainment (n = 355, 44.6%). Spanish speakers had the highest percentage of some college or higher educa-tional attainment (47.1%). More than 60% (67.2%) of partic-ipants were currently employed, with Spanish speakers having the highest percentage of being currently employed (n = 283, 70.6%).

Among the three groups, Spanish speakers were more likely to be currently married (n = 206, 51.4%). Less than half of participants were a patient of the clinic for 2 years or longer (41.2%), while the percentage was slightly higher among non-US born English speakers and Spanish speakers with respect to the total number of participants (53.4%, 46.9%; *P* < .01).

Approximately 60% of participants responded that they received information about healthy living classes at the free clinic. Spanish-speaking participants received notice of healthy living class information at a higher rate compared to non-US-born English speakers and US-born English speakers (65.1%, 51.5%, and 56.0%; *P* < .01). Only 22.4% of the participants have attended health education programs that the clinic offers for its patients, with an average attendee age of 48 years.

About 51.9% of participants reported having a family medicine doctor, nurse practitioner, and physician assistant as a primary care provider; however, this percentage is higher among Spanish speakers (61.6%) compared to English-speaking patients (39.3%). On average, 24.9% and 35.9% of the clinic's patients showed a history of diabetes and hypertension.

The average age of all participants was 48 years old (SD = 13.93). US-born English speakers (45.5 [SD = 13.64]) were slightly younger than non-US-born English speakers (45.5 [SD = 13.64]), and Spanish speakers (45.5 [SD = 13.64]. On average, non-US-born English speakers reported to have slightly better health (2.99 [SD = 1.04] than US-born English speakers (3.35 [SD = 1.03]) and Spanish speakers (3.14 [SD = 0.89]). We found that non-US-born English par-ticipants (5.36 [SD = 5.62]), followed by Spanish speaking participants (5.74 [SD = 6.02]), reported the lowest levels of depression compared to US-born English-speaking partic-ipants (9.33 [SD = 7.51]). General adherence was slightly

Table 1. Socio-Demographic Characteristics of Participants and Descriptive Statistics.

	Total (N = 796)	US born English speakers (n = 191)	Non-US born English speakers (n = 204)	Spanish speakers (n = 401)	P-value	
Frequency (%)						
Female	289 (36.3)	86 (45.0)	69 (33.8)	134 (33.4)	<.05	
Race/ethnicity						
White – Non-Hispanic	157 (19.7)	134 (70.2)	18 (8.8)	5 (1.2)	<.01	
Hispanic/Latino/Latina	493 (61.9)	29 (15.2)	74 (36.3)	390 (97.3)	<.01	
Asian or Pacific Islander	101 (12.7)	10 (5.2)	91 (44.6)	0	–	
Some college or higher	355 (44.6)	74 (38.7)	92 (45.1)	189 (47.1)	N.S.	
Currently employed	535 (67.2)	124 (64.9)	128 (62.7)	283 (70.6)	N.S.	
Currently married	380 (47.7)	84 (44.0)	90 (44.1)	206 (51.4)	N.S.	
US born	197 (24.7)	191 (100)	0	6 (1.5)	–	
Patient of the clinic – 2 years or longer	328 (41.2)	31 (16.2)	109 (53.4)	188 (46.9)	<.01	
Received a reminder by phone	447 (56.2)	76 (39.8)	108 (52.9)	263 (65.6)	<.01	
Received a reminder by text message	445 (55.9)	76 (39.8)	117 (57.4)	252 (62.8)	<.01	
Noticed healthy living class information	473 (59.4)	107 (56.0)	105 (51.5)	261 (65.1)	<.01	
Had attended health education program	178 (22.4)	35 (18.3)	43 (21.1)	100 (24.9)	N.S.	
Go back to work after appointment	254 (31.9)	54 (28.3)	68 (33.3)	132 (32.9)	N.S.	
Primary provider – physician	413 (51.9)	75 (39.3)	91 (44.6)	247 (61.6)	N.S.	
Diabetes	198 (24.9)	46 (24.1)	49 (24.0)	103 (25.7)	N.S.	
Hypertension	286 (35.9)	63 (33.0)	80 (39.2)	143 (35.7)	N.S.	
Mean (SD)						F
Age	48.00 (13.93)	45.5 (13.64)	48.72 (14.75)	48.91 (13.47)	<.05	4.12
Self-reported general health	3.15 (0.97)	3.35 (1.03)	2.99 (1.04)	3.14 (0.89)	=.01	7.17
Depression	6.62 (6.57)	9.33 (7.51)	5.36 (5.62)	5.74 (6.02)	<.01	20.85
General adherence	74.12 (22.40)	76.40 (23.58)	71.38 (22.31)	74.31 (21.72)	N.S.	2.11
Specific (lifestyle) adherence	31.61 (25.78)	27.87 (22.22)	32.57 (29.76)	33.56 (25.66)	N.S.	0.61
Medication adherence	1.41 (0.44)	1.42 (0.45)	1.42 (0.48)	1.40 (0.41)	N.S.	0.15

No. (%) or Mean (SD). N.S. – Not significant. N/A – Not applicable.
P-value denotes significance from Pearson's Chi-square tests between categorical variables (for cell size ≥5 only), and ANOVA tests for continuous variables comparing US born English speakers, non-US born English speakers, and Spanish speakers.
Self-reported general health – Higher scores = worse health.
Depression – Higher scores – higher depression.
Higher scores indicate higher levels of general or specific adherence.
Higher scores indicate lower levels of medication adherence.

higher among US-born English speakers (76.40 [SD = 23.58]) compared to total participants (74.12 [SD = 22.40]). However, specific lifestyle adherence was marginally higher for Spanish speaking participants (33.56 [SD = 25.66]) compared to total participants (31.61 [SD = 25.78]).

Table 2 presented predictors of patient general adherence and factors associated with higher levels of general adherence. Our regression result showed that with each additional year of age, patient general adherence decreases ($\beta = -0.428$, $P < .01$). In addition, we could see that with an/the increase in specific (lifestyle) recommendations, patient general adherence increases ($\beta = 0.329$, $P < .01$). Therefore, we concluded that our result showed general adherence was associated with younger age, levels of adherence to specific (lifestyle) recommendations, and medication ($P < .01$).

Moreover, having attended health education class and having a primary care provider are not associated with levels of general adherence. Education level, employment, marital status, and being a clinic patient of the clinic for more than two years were significantly associated with patients' level of general adherence in our regression model.

Table 2. Predictors of Patient General Adherence.

	β	P-value
Age	−0.428	<.01
Female	−0.1	N.S.
Some college or higher	0.039	N.S.
Employed	0.065	N.S.
Married	−0.115	N.S.
Clinic patient 2+ years	0.126	N.S.
Physician	0.159	N.S.
Specific (lifestyle) adherence	0.329	<.01
Medication adherence	−0.304	<.01
Attended health education class	0.021	N.S.
Health	−0.007	N.S.
Depression	0.083	N.S.
(Constant)	113.049	<.01
R^2	0.186	
F	2.69	
P-value	<0.01	

N = 796. P-value denotes significance from multivariate regression analysis. N.S. – not significant.

Discussion

This study analyzed the association between free clinic patients' general level of adherence and specific lifestyle adherence behavior, self-reported health, and sociodemographic characteristics of patients; resulting in three main findings. First, younger age was associated with higher levels of adherence to medication and specific behavior (lifestyle) recommendations. Second, higher levels of lifestyle and medication adherence are associated with higher levels of general adherence. Third, having attended a health education class and having a primary care provider were not associated with levels of general adherence. Interestingly, however, being a long-term patient of the clinic was associated with increased general adherence.

The results of this study were consistent with a previous finding on the association between patients' age and medication adherence. The reasoning behind lower adherence among older adults could be due to neurodegenerative functional impairment, polypharmacy, complex regimens, and lack of illness perception (26). However, some studies have reported that lower adherence was observed among the younger population, yet other studies reported no association between age and levels of adherence. This discrepancy could be due to the types of health conditions among the different populations (19). Higher levels of patient involvement in care in underserved populations are associated with higher levels of patient-centered care (27). Therefore, it is important for providers to involve patients in treatment, diagnosis, and medication instructions (27). Health care providers may need to place an increased effort into communicating their recommendations to older patients. Thus, based on the results of our study, older free clinic patients may benefit more from the domains of patient-centered care to reach attainable goals regarding their health and illness.

Previous studies exploring the complex dosing of medication indicate that complicated treatment medication significantly affects a patient's level of general adherence (28). In this study, our result demonstrated that higher medication adherence, regardless of its complexity, is associated with higher general adherence. Our results also demonstrated that higher levels of behavioral and lifestyle adherence were associated with higher levels of general adherence. This result was particularly important because the majority of free clinic patients were at high risk for chronic conditions, including diabetes, which was closely related to the self-management of lifestyle (29). Diabetic patients of free clinics have been shown to have poor physical health with high levels of dysfunction, indicating the importance of improving adherence to lifestyle changes (30). Lifestyle changes such as self-monitoring, a healthy diet, and an increased level of physical activity may prevent or limit the number of chronic illnesses (31). Another study has shown that poor adherence to self-monitoring explains low participation in online weight loss programs (32). This supports our result that higher levels of lifestyle adherence may result in better general adherence levels. Thus, both medication and lifestyle adherence are significant predictors of the general level of adherence resulting in improved free clinic patient health outcomes.

Health care education and health care professionals have a significant role in improving patient adherence (33). However, our result indicates that just attending health education classes that provide an array of health care topics and having a primary care provider may not be enough to affect patients' level of general adherence at free clinics. Continuity of care is an important aspect of health care. A previous study at the free clinic has shown that clear guidelines and instruction from health care providers for a patient's treatment regimen was associated with an improved level of continuity of care (34). Improving continuity of care with patients with chronic conditions may result in higher medication adherence (35). Therefore, improving long-term provider-patient relationships would benefit patients by providing straightforward guidelines and health education from their health care provider, resulting in higher patient adherence.

Limitation

While this study contributes to knowledge regarding factors associated with levels of adherence among free clinic patients, it is, nonetheless, characterized by some limitations. Because this study was cross-sectional, the causal direction between variables cannot be determined. The Cronbach measure of the general adherence scale used in this study was 0.66, which is below the excellent score for reliability or internal consistency. The study was conducted only among Spanish and/or English-speaking patients. Those who did not speak either of these two languages were not included. Data for this study were collected at one clinic

and may not be generalizable to other free clinic patients. However, this study provides valuable results on patient adherence which can be further explored in future studies. Future studies are needed to include other free clinic patients with more diverse demographic backgrounds.

Conclusion

Patient nonadherence is a widespread issue among the general population and is an even more significant concern among underserved populations. The findings of this study contribute to a better understanding of free clinic patients' adherence to medical provider recommendations and medication regimens. This study revealed an important negative association of age to levels of adherence among free clinic patients. It also documented the importance of the provider's lifestyle recommendation and medication adherence as key indicators to predict the overall level of general adherence. The study results support a call to action for improving patient adherence among older free clinic patients by promoting patient-centered care. Further studies are needed to understand free clinic general adherence better.

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