

Adherence Is Adherence Is Adherence: The Consistency of Morisky Adherence Scores Across the Costliest Chronic Conditions

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Introduction

- Patient non-adherence to prescribed therapies has been shown to be associated with worse health outcomes (e.g., Law et al., 2010).
- However, adherence is often examined within the context of a single condition. It is unclear the extent to which adherence varies as a function of the condition versus the patient. In other words, it is unknown whether non-adherent behaviors associated with the treatment regimen of one condition are predictive of non-adherent behaviors with another.

Objective

- The aim of this study was to investigate the consistency of adherence scores across the costliest chronic conditions in the U.S.

Methods

Sample

- Data from the 2010 U.S. National Health and Wellness Survey (NHWS) were used.
- The NHWS is a self-administered, Internet-based questionnaire from a nationwide sample of adults (aged 18 or older) that is stratified by gender, age, and race/ethnicity to represent the demographic composition of the U.S. adult population.
- Included for analysis were only those patients (N=32,636) who reported using a medication for their asthma, pain, congestive heart failure (CHF), COPD, diabetes, hypertension, depression, bipolar disorder, peripheral vascular disease (PVD), transient ischemic attack (TIA), or stroke. These eleven conditions were identified as costliest in the U.S. (Druss et al., 2002).

Measures

- **Comorbidity Assessment.** Respondents to NHWS reported the conditions that they were currently experiencing, and if positive, they were subsequently asked whether those conditions had been diagnosed by a physician and whether they were currently taking a prescription medication for their condition.
- **Medication Adherence.** Respondents then completed a Morisky Medication Adherence Scale (MMAS) separately for each condition for which they were taking a prescription medication. The MMAS is a four-item scale that assesses the presence versus absence of the following non-adherent behaviors:
 - being careless about taking medications,
 - stopping medications when feeling better,
 - stopping medications when feeling worse, and
 - forgetting to take medications.
- Both the number of non-adherent behaviors as well as whether someone was completely adherent or not (engaging in 0 vs. 1 or more behaviors, respectively) were used as definitions in this study.

- **Health Utilities.** The SF-6D was used as a measure of health state utilities. The SF-6D was calculated from the items of the SF-12v2.

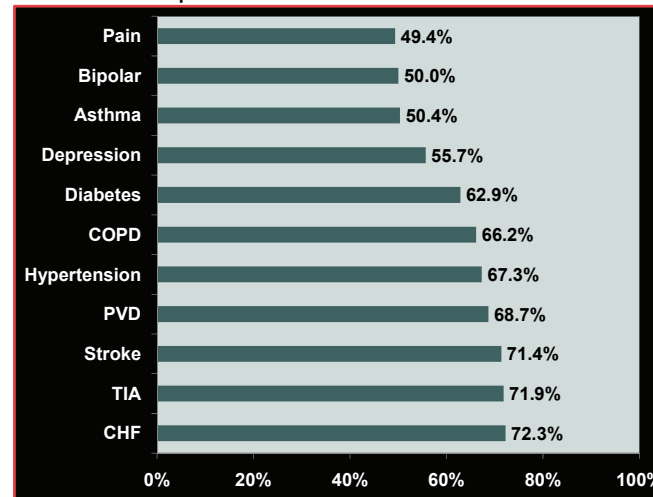
Statistical analysis

- Descriptive statistics were reported for adherence levels across conditions. Consistency of adherence scores was examined using Pearson correlations as well as Cronbach's α . The relationship between the number of non-adherent behaviors and health state utilities was examined using linear regression. A priori statistical significance was specified as $p < 0.05$.

Results

- Among patients taking prescription medication for asthma (n=4,786), pain (n=8,984), CHF (n=905), COPD (n=1,664), diabetes (n=7,065), hypertension (n=19,475), depression (n=7,850), bipolar disorder (n=1,425), PVD (n=163), TIA (n=437), or stroke (n=507), 48.9% were male, 79.3% were white, and mean age was 54.9 years (SD=15.3).
- Adherence levels varied across the chronic conditions, with patients taking medications for pain and bipolar disorder reporting the lowest levels of complete adherence (49.4% and 50.0%, respectively) and patients with TIA and CHF reporting the highest level of complete adherence (71.9% and 72.3%, respectively; see Figure 1).
- However, no condition had more than 73% of patients who were completely adherent to their medication regimens.

Figure 1. Levels of Complete Adherence for Top 11 Costliest Chronic Conditions



- Across all eleven conditions, high internal consistency was observed for total MMAS scores (Cronbach's $\alpha=0.97$) and all MMAS items ("careless about taking medications", $\alpha=0.97$; "stop taking medications when feeling better", $\alpha=0.94$; "stop taking medications when feeling worse", $\alpha=0.96$; and "forgetting to take medications", $\alpha=0.97$).
- The number of respondents sharing any two conditions ranged from n=9 to n=4,563, yet MMAS total score correlations across any two conditions were all significant, ranging from $r=0.41$ to $r=1.00$ (see Table 1).

Table 1. Pearson Correlations of Adherence Levels for the Top 11 Costliest Chronic Conditions

		Pain	CHF	COPD	Diabetes	Hypertension	Depression	Bipolar	PVD	TIA	Stroke
Asthma	r	0.659	0.678	0.855	0.598	0.560	0.612	0.513	0.727	0.867	0.755
	N	1194	121	556	675	1592	1080	255	25	51	41
Pain	r	--	0.592	0.562	0.534	0.547	0.613	0.575	0.411	0.701	0.742
	N		306	604	1696	4091	2535	449	74	166	150
CHF	r		--	0.788	0.829	0.911	0.839	0.796	0.943	1.000	0.902
	N			178	364	653	178	36	26	54	53
COPD	r			--	0.646	0.623	0.554	0.592	0.763	0.789	0.863
	N				373	916	455	94	37	51	48
Diabetes	r				--	0.803	0.711	0.653	0.764	0.895	0.718
	N					4563	1216	192	56	124	139
Hypertension	r					--	0.752	0.741	0.822	0.926	0.869
	N						2764	439	113	302	341
Depression	r						--	0.875	0.804	0.774	0.814
	N							1054	53	103	102
Bipolar	r							--	0.983	0.987	0.946
	N								9	23	21
PVD	r								--	1.000	1.000
	N									18	17
TIA	r									--	0.985
	N										135

*All correlations were significant, $p < 0.0001$

Results (continued)

- With the exception of pain, the number of non-adherent medication behaviors within each condition was associated with lower health state utilities (though not always significantly: $r=-0.02$ to $r=-0.12$). Regression estimates for these models are shown in Table 2.
- The results for pain remained consistent even when focusing solely on those with chronic pain (e.g. those who experienced pain in the last month and who had used their current medication for at least 3 months).

Table 2. Regression Estimates of Number of Non-Adherent Medication Behaviors Predicting Health State Utilities (SF-6D)

	Intercept	b	p
Asthma	0.682	-0.006	0.0024
Pain	0.609	0.007	<.0001
CHF	0.641	-0.007	0.2000
COPD	0.627	-0.009	0.0075
Diabetes	0.709	-0.017	<.0001
Hypertension	0.735	-0.019	<.0001
Depression	0.603	-0.002	0.1484
Bipolar	0.602	-0.007	0.0051
PVD	0.623	-0.012	0.2600
TIA	0.651	-0.016	0.0600
Stroke	0.629	-0.021	0.0075

Discussions

- The results suggest that non-adherence is an important issue for the costliest conditions, as anywhere from 25 to 50% of patients with these conditions report regular non-adherent behaviors.
- Aside from pain (where the positive relationship with health state utilities may be due to non-adherence reflecting improved health), non-adherence was associated with poorer health state utilities.
- The evidence also suggests that non-adherence is a stable construct, being consistent from condition to condition within each patient.

Conclusions

- Non-adherence on one therapy may be an indicator of non-adherence on another therapy, even across different conditions.

References

- Druss BG, Marcus SC, Olfson M, Pincus HA. The most expensive medical conditions in America. Health Affairs 2002; 21:105-111.
- Law MR, Soumerai SB, Ross-Degnan D, et al. A longitudinal study of medication nonadherence and hospitalization risk in schizophrenia. J Clin Psychiatry 2008;69:47-53.

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