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ESTIMATING THE RELIABILITY OF THE MEDICATION ADHERENCE REASONS SCALE (MAR-SCALE) IN ASTHMA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) AND IDENTIFYING THE REASONS FOR NON-ADHERENCE

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Chronic Respiratory Diseases

GLOBAL BURDEN OF CHRONIC RESPIRATORY DISEASES

- Chronic respiratory diseases accounts for 6.3% of global years lived with disability (YLDs);
  - COPD contributing to 29.4 million YLDs and Asthma, 13.8 million YLDs.[1]

NON-ADHERENCE WITH MEDICATIONS TO ASTHMA AND COPD

- Literature reports adherence to asthma medications between 30-70% and that to COPD medications at <50%.[2,3]
- Knowing the prevalence and reasons for non-adherence to asthma/COPD medications are beneficial in developing both patient and population level adherence improvement interventions.

This calls for the need to develop a reliable self-reported adherence measure so that reasons for non-adherence can be understood.

1. Vos T, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease study 2010.Lancet 2012;380: 2163–96.
2. Rand CS, et a. Measuring adherence to asthma medication regimens. Am J Respir Crit Care Med. 1994;149(2 Pt 2):S69-76; discussion S77-8. Review.
3. Restrepo RD, et al. Medication adherence issues in patients treated for COPD. Int J Chron Obstruct Pulmon Dis. 2008;3(3):371-84.

Background

MEDICATION ADHERENCE REASONS SCALE (MAR-SCALE)

- A comprehensive self-report measure that assess the different aspects of non-adherence, such as reasons and frequency
- The scale has demonstrated acceptable reliability and validity in 17 disease areas[4]
- Previous exploratory factor analyses have found that the MAR-Scale has 4 domains
  - Non-adherence due to logistic issues (8 items). E.g.: Difficulty swallowing
  - Non-adherence due to belief issues (4 items) E.g.: Skip medicine to see if it is still needed
  - Non-adherence due to forgetfulness issues (4 items) E.g.: Forgetfulness due to a busy schedule
  - Non-adherence due to long-term concerns (3 items) E.g.: Concern about the potential side effects from the medicine

4. Unni EJ, Sternbach N, Goren A. Using the Medication Adherence Reasons Scale (MAR-Scale) to identify the reasons for non-adherence across multiple disease conditions. Patient Prefer Adherence. 2019 Jun 28;13:993-1004.

Objective

MEDICATION ADHERENCE REASONS SCALE (MAR-SCALE)

- The objective of this study was to describe the reasons for non-adherence and to establish the reliability of the Medication Adherence Reasons Scale (MAR-Scale) in measuring non-adherence to medications in asthma and COPD.

Methods and Sample

- Data from the 2018 National Health and Wellness Survey (NHWS), a self-administered, annual, internet-based cross-sectional survey of US adults (age 18+) was used.
- NHWS uses a random stratified sampling framework (sex, age, race/ethnicity) to ensure that it is representative of the demographic composition of the US adult population, based on data from the US Bureau of the Census.
- The NHWS has been approved by Pearl IRB (Indianapolis, IN, USA).
- Respondents who self-reported a physician diagnosis of asthma and/or COPD and reported taking daily prescription medication(s) to treat their asthma and/or COPD were given the MAR-Scale.
  - Asthma medication daily use (n=2,810)
  - COPD medication daily use (n=1,632)

Medication Adherence Reasons Scale (MAR-Scale)

- The scale has 19 specific reasons for non-adherence and one global item
  - Respondents were shown the 19 items from the MAR-Scale and were asked to select all the items that were reasons for their non-adherence in the past week. For the items chosen by the respondent, they then selected the number of days, using a 7-point scale (1 day to 7 days) in which that reason was a cause of their non-adherence.

For the following questions, please think about your **DAILY** medicine or medicines for **asthma** (i.e., medicine prescribed for use every day). These medications include:
Over the last **7 days**, which of the following were reasons you did **NOT** take the medicine or medicines above as prescribed? **MULTI SELECT**

1	I had side-effects from the medicine.
2	I did not have money to pay for the medicine.
3	I was not comfortable taking it for personal reasons (e.g. tired of taking medicine, too sick, my religious beliefs).
4	I was not comfortable taking it for social reasons (e.g. I was with friends).

  - The global item provides an overall estimate of the frequency of medication adherence. Respondents use an 8-point scale (0 days to 7 days), to report the number of days they took the medicine as prescribed in the past week.

Over the last **7 days, how many days** were **YOU ABLE TO** take your **DAILY** medicine or medicines for

	0 days (have not taken the medicine or medicines in the last 7 days)	1 day	2 days	3 days	4 days	5 days	6 days	7 days (took the medicine or medicines on all of the 7 days)
	0	1	2	3	4	5	6	7

Statistical Analysis

Descriptive statistics

- Counts and percentages

Cronbach alpha.

- All values must be ≥ 0.70[5]

Categorical confirmatory factor analysis (CCFA)

- All models utilized a mean- and variance-adjusted diagonally weighted least squares estimator
- All models must exceed criteria for two global fit indices
  - The standardized root mean square residual (SRMR; <0.08)
  - The comparative fit index (CFI; >0.95)
- All standardized factor loadings (FL) needed to be greater than 0.50 and significant (p<0.05), indicating a strong relationship between the item and the latent factor

5. Nunnally, J. C. (1978). Psychometric Theory (2nd ed.). New York: McGraw-Hill.

Results

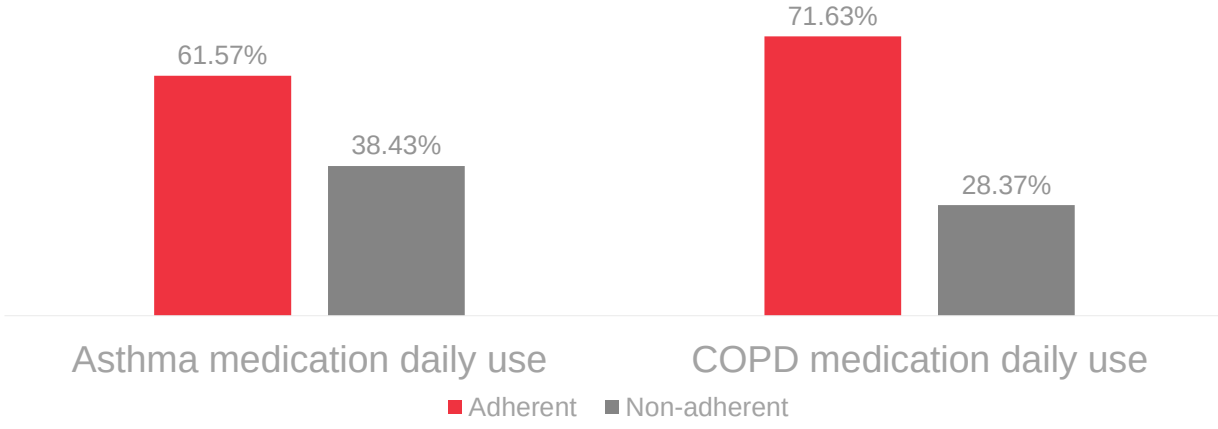
Table 1. Patient demographics	Asthma medication daily use (%) (N = 2,810)	COPD medication daily use (%) (N = 1,632)
Gender		
Male	30.93	42.52
Female	69.07	57.48
Race/Ethnicity		
White	71.39	85.17
Hispanic	8.15	3.06
African American	10.50	6.68
Asian	3.95	0.86
Other	6.01	4.23
Education		
Less than high school/completed some high school	3.20	4.47
High school graduate or equivalent	19.11	26.04
Completed some college/Associate degree	40.53	46.75
College graduate/completed some grad school	23.63	16.42
Completed graduate school	13.52	6.25
Has health Insurance	94.23	95.96
Has prescription coverage through insurance*	94.52	93.74

* Among those with health insurance

- Female were more likely to be on medication for both asthma and COPD than men.
- Majority of respondents were White.
- Almost all respondents had health insurance and prescription medication coverage.

Results

The overall medication non-adherence rate in asthma was 38.43% and 28.37% in COPD (based on the 19 items)



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Results

Top reasons for medication non-adherence in asthma and COPD

	Asthma (n=2,810)		COPD (n=1,632)	
	% of patients who missed	Mean # days missed	% of patients who missed	Mean # days missed
Simply missed the medicine	13.7%	2.21	11.3%	1.94
Skip the medicine to see if it is still needed	8.2%	3.15	4.8%	3.22
Missed the medicine because of busy schedule/change in routine	6.3%	2.64	3.2%	2.44
Don't think that they need the medicine anymore	6.2%	4.57	3.0%	4.51
Did not have money to pay for the medicine	4.9%	4.03	5.1%	4.46
Side-effects from the medicine	4.7%	3.5	2.7%	3
Forgetfulness due to cognitive issues	4.5%	3.23	3.4%	2.69
Concerned about long-term effects from the medicine	4.2%	4.13	2.2%	3.47
Do not consider taking the medicine as a high priority in my daily routine	4.2%	4.33	2.3%	4.16
Concerned about possible side-effects from the medicine	4.1%	4.04	2.0%	3.22
Don't think that the medicine is working for them	3.0%	3.86	2.1%	4.15
Trouble managing all the medicines they have to take	2.6%	3.45	1.5%	4.04
Not comfortable taking it for personal reasons	2.5%	3.62	1.5%	4.32
Not comfortable taking it for social reasons	2.0%	3.44	1.3%	4.14
Missed the medicine because the pharmacy was out of this medicine/out of refills/mail order did not arrive in time	1.9%	3.94	2.1%	3.94
Difficulty swallowing the medicine or inhaling the medicine	1.7%	4.33	0.9%	5.73
Missed the medicine because they didn't have a way to get to the pharmacy/provider	1.6%	3.59	1.2%	4.25
Difficulty opening the container	1.5%	3.81	1.3%	4.09
Not sure how to take this medicine	1.0%	4.5	0.9%	5.29

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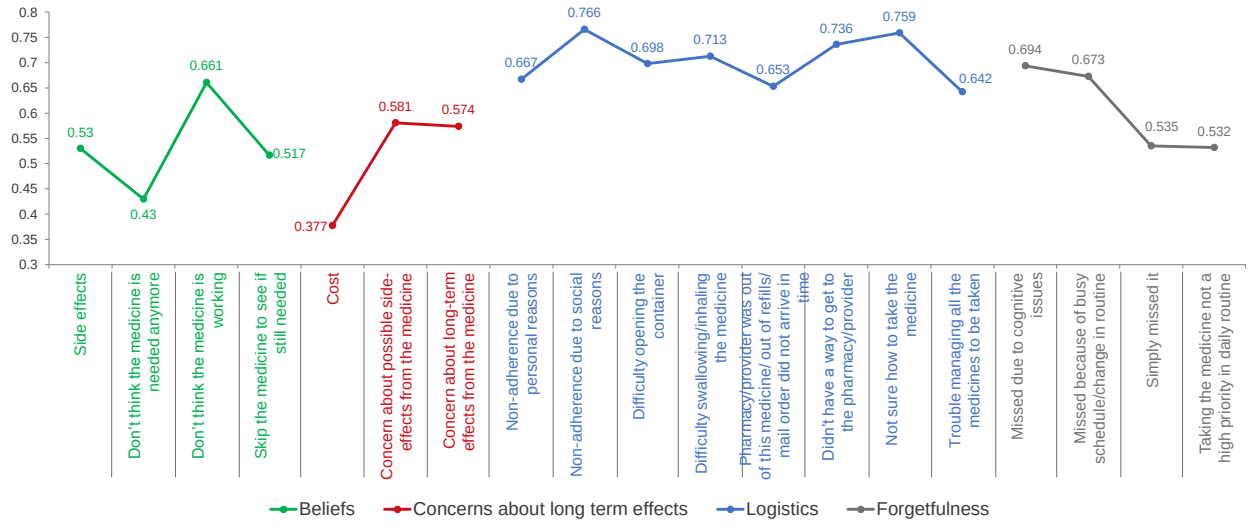
Results

- The scale demonstrated acceptable reliability statistics

	Asthma medication	COPD medication
Cronbach Alpha	0.880	0.932
Goodness Of Fit Index	0.982	0.994
Standardized Root Mean Square Residual	0.048	0.036

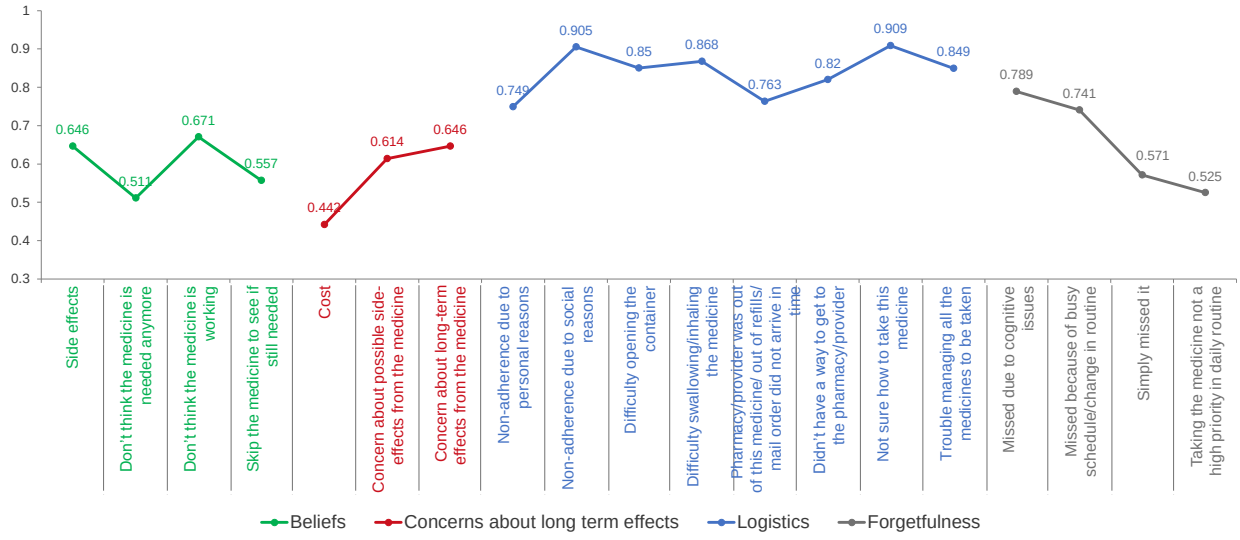
Results

Asthma Daily Use Medicines: Covariance Structure Analysis: Diagonally Weighted Least-Squares Estimation Standardized Factor Loading Matrix



Results

COPD Daily Use Medicines: Covariance Structure Analysis: Diagonally Weighted Least-Squares Estimation Standardized Factor Loading Matrix



Strengths & Limitations

- **Strengths**
  - National database with various quality control measures
  - Large sample size for a self-reported study
  - Medication non-adherence rates similar to previous studies[6]
  - Detailed insight and quantification of the various reasons for non-adherence

- **Limitations**
  - Analyses are based on self-report data of adherence measures. Recall bias may introduce error, in addition to overestimation of adherence
  - However, keeping in mind that self-reported adherence data are often skewed, correction factors ought to be applied to data for further analysis
  - Cross sectional studies account for only one point in time and do not capture adherence behavior over time. Replicating these results with a longitudinal study would be beneficial

6. World Health Organization. (2003). Adherence to long-term therapies : evidence for action / [edited by Eduardo Sabaté]. World Health Organization. https://apps.who.int/iris/handle/10665/42682

Conclusions

- Reasons for non-adherence with asthma and COPD
  - MAR-Scale identified the most common reasons for non-adherence in both asthma and COPD medications
  - MAR-Scale differentiated between the most frequent reason and most impactful (i.e., number of days) reason of non-adherence for asthma and COPD medications
- Scale reliability and validity
  - MAR-Scale provided an overall rate estimate for non-adherence
  - MAR-Scale demonstrated acceptable reliability with both asthma and COPD medications
  - A previously identified 4-factor model was replicated in each condition

Overall, the MAR-Scale can be used as a scale to measure adherence with asthma and COPD medications

Questions?

Contact: Elizabeth Unni (elizabethjunni@gmail.com) or Kantar (shaloo.gupta@kantar.com) for questions regarding use of MAR-Scale

Research Poster Presentation Tomorrow:

ASSESSMENT OF THE INTERNAL CONSISTENCY AND CONCURRENT VALIDITY OF THE MEDICATION ADHERENCE REASONS SCALE (MAR-SCALE) IN AN ATTENTION-DEFICIT/HYPERACTIVITY DISORDER POPULATION-BASED SAMPLE

RESEARCH POSTER SESSION 4
PMH: MENTAL HEALTH
Tuesday, November 5, 2019; 15:45 - 19:00

All research is conducted in accordance with the requirements of our Quality System, which confirms to ISO 20252:2012 the International Standard for Market Research, Certification Number : 1019