TEXAS MEDICAL ASSOCIATION

Physicians Caring for Texans

TexMed 2017 Quality Research Abstract

Please complete all of the following sections and include supporting charts and graphs in this document. Submit a total of two documents - this document and the Biographical Data and Disclosure Form to posters@texmed.org by midnight March 17, 2017.

Description and Selection Criteria

- Applicants should demonstrate an understanding of systematic investigation through research development, testing and evaluation designed to develop or contribute to generalizable knowledge. Judges will use the scoring described in this matrix to identify projects to be presented at the conference, as well as, projects to be considered for the awards.
- The focus for Quality Research abstracts is any project that is conducted with an intent to answer a research question or test a hypothesis related to quality improvement (QI). It is also intended to develop or contribute to generalizable knowledge. Projects in Quality Research need to have approval from an Institutional Review Board or have a formal letter of exemption. Traditional QI activities, on the other hand, cover the gamut of projects that are:
    - aimed at improving local systems of care, or improving the performance of institutional practice;
    - designed to bring about immediate improvements in health care delivery; or
    - intended to compare a program/process/system to an established set of standards such as standard of care, recommended practice guidelines, or other benchmarks.

  If you have a question about whether your project is Quality Research or a QI project, please contact us.
- These submissions should provide general information related to the one of the following categories: patient safety, patient centered care, equity, timeliness, efficiency, or effectiveness.
- Maximum points delineated with a brief explanation of the content that should be included under each section. Applicants may describe the problem and results in narrative or graphic format.

PROJECT NAME:

Factors associated with Obesity Recognition in Primary Care Outpatient Clinic: Who are Diagnosed?

Institution or Practice Name: Midwestern State University, Wichita Falls Family Practice Residency Program

Setting of Care: Primary care outpatient setting

Primary Author: Johnathan Williams MD

Secondary Author: Adil Ahmed, MD, MHI, MSc

Other Members of Project Team: David Carlston PhD1,2, Haley Tate2 , Alen Ajanovic MD1, Ammar Alsodon MD1, Hisham Mohammed MD1, Arthur Szczerba MD1

Is the Primary Author, Secondary Author or Member of Project Team a TMA member (required)?

☒ Yes ☐ No

Please provide name(s): Adil Ahmed, MD, MSc, and Johnathan Williams MD

Project Category: *(Choose all categories)*

☐ Patient Safety	☒ Patient Centered Care	☐ Timeliness	☐ Enhanced Perioperative Recovery
☒ Efficiency	☐ Effectiveness	☐ Equity	☐ Disaster Medicine & Emergency Preparedness

For this poster session, TMA is looking for research projects that demonstrate the six aspects of Quality Care as defined by the Institute of Medicine.

- Safe - avoids injuries to patients from care that is intended to help them
- Timely - reduces waits and delays for both those who receive care and those who give care
- Effective - based on scientific knowledge, extended to all likely to benefit, while avoiding underuse and overuse
- Equitable - provides consistent quality, without regard to personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status
- Efficient - avoids waste, including waste of equipment, supplies, ideas, and energy
- Patient centered - respects and responds to individual patient preferences, needs, and values, ensuring that patient values guide all clinical decisions

Introduction (15 points max): .

The Centers for Disease Control and Prevention (CDC) and other sources use an individual's body mass index (BMI) to identify and categorize obesity. For adults, a BMI between 30-39.9 is considered obese and a BMI over 40 is considered morbidly obese [1]. Using this classification system, more than one-third of Americans are currently obese[2]. The impact of increasing obesity rates is significant. Currently, obesity is one of the greatest drivers of preventable chronic disease and healthcare costs in the United States. Obese individuals are more than twice as likely to be prescribed medications to manage their comorbid medical conditions compared to their healthy-weight counterparts [3]. Moreover, obesity plays a major role in modifying treatment outcomes associated with comorbid chronic disease [4]. As a result, obesity is associated with significant health care costs, with estimates ranging from $147 billion to nearly $210 billion annually [5].

The ability to identify and manage the care of patients who meet criteria for obesity in ambulatory settings has significantly improved with the increased use of health information technology, especially electronic medical records (EMR)[6]. For example, researchers have found that electronic prompts regarding BMI not only improve the rates of obesity documentation but, more importantly, increase the frequency of patient weight specific visits, and increase the frequency of weight loss counseling[7]. Unfortunately, these studies also suggest that obesity documentation rates still remain low [8-10]. .

Hypothesis (15 points max):

The primary aim of this study is to examine factors associated with obesity documentation in the EMR and to identify the patient characteristics associated with documentation in the EMR. This work was made possible through the financial contribution from the Texas Academy of Family Physicians

Methods (25 points max):

We conducted a secondary analysis of a retrospective review of adult patients treated between 2012 and 2015. The institutional review board of Midwestern State University approved the study (Institutional Review Board #15102701).

STUDY SETTING AND POPULATIONS: We reviewed patient EMR gathered through routine care at the Wichita Falls Family Practice Clinic. The clinic is the host of a private family medicine residency program with five faculty members and 24 residents spanning three post-graduate levels. The clinic uses e-MD© as its EMR system.

DATA EXTRACTION: We used ICD-9 code 278 to identify obese patients seen between January 2012 and June 2015; only two codes were identified in our database (278.01, 278.02). Adults aged 18 years and older with two or more visits during the study window were included in the study. Children and pregnant women were excluded because strict BMI interpretation is particularly less meaningful in these patient populations.

STATISTICAL APPROACH: The demographic characteristics of those with and without documentation are presented as totals and percentages for categorical variables and median interquartile range (IQR) for continuous variables. These data were compared using Wilcoxon rank-sum and Fisher's exact tests, respectively. Our primary outcome was factors associated with obesity documentation. For those with BMI≥30, multivariate logistic regression was used to identify the independent variables associated with obesity documentation; three statistical models were run for sensitivity analysis. All models included the baseline characteristics as covariates, including age, gender, race, and type of insurance, and BMI-related variables. In Model 1, we included BMI as a continuous variable; in Model 2, we included morbid obesity status in addition to BMI; and in Model 3, we included BMI, morbid obesity status (BMI≥40), and the total number of comorbidities as covariates. Odd ratios with 95% confidence intervals were calculated for each variable in the model. STATA (Version 14.1) and JMP statistical software © (Version 11, SAS Institute) was used for all data analyses.

Results (25 points max):

During the study period, medical records were evaluated for 3,868 patients accounting for 15,790 office visits. The median number of visits for participants was two. The prevalence of obesity with EMR-generated BMI (BMI ≥ 30.0) was 2,003, 51.7% of included patients. Of these 112 BMI eligible patients, only 5.6% had obesity documented in their patient problem lists. Baseline characteristics for those with and without obesity documentation are presented in Table 1. Compared to those without documentation, patients with documented obesity were a) significantly younger, b) more likely to be female, c) had a higher median BMI, and d) were more likely to be morbidly obese.

In the multivariate analysis, age and gender were significant in all three models. When morbid obesity was included in the second model, it was also significantly associated with documentation OR [95%CI]=1.6 [1.4-1.9]. Finally, when the cumulative number of comorbidities was added to the model, it

was also significantly associated with documentation of obesity, OR [95%CI]=1.3 [1.0 -1.7] (see Table 2).

Conclusions/ Discussion (20 points max):

In the present study, we demonstrated the low prevalence of obesity documentation in medical records. We identified predictors of documentation including age, gender, the number of comorbidities, and obesity severity. Specifically, we demonstrated that females with morbid obesity were much more likely to have a diagnosis of obesity included in their EHR, possibly due to the visual undeniability of problem severity. It is important to note that, once an individual reaches the point of morbid obesity behavioral interventions are less likely to be successful and surgery is the appropriate option according to the current guidelines.

Multiple barriers have been identified in previous studies that could have contributed to the lack of addressing obesity as a separate medical condition rather than a sequela. Patients may have been deterred from discussing their obesity with their primary care physician because of their ambivalence about the treatment options and stigmatizing emotional state associated with an obesity diagnosis [11]. On the other hand, some reports suggest that the lack of knowledge and familiarity with guidelines is another reason for physicians to shy away from addressing the problem [12].

In conclusion, these findings, suggest that obesity is generally not recognized as a primary medical problem. Women and morbidly obese patients are more likely to have documented obesity, however, at that point it might be late for behavioral interventions to be successful.

Acknowledgements: Research reported in this abstract was financially supported by Texas Academy of Family physician (TAFP)

Table (1) Baseline characteristic table between documented and none documented obesity

Variable		Obesity Not-documented (N=1891)	Obesity documented (N=112) ††	p-value
Age, median (IQR)		48.7 (36.7, 56.2)	44.9 (33.55, 53.8)	0.01†
Gender n(%)	Female	1113 (58.9%)	84 (75.0%)	<0.01*
	Male	778 (41.1%)	28 (25.0%)	
Ethnicity n(%)	Hispanic or Latino	105(5.6%)	7 (6.3%)	0.68*
	Not Hispanic or Latino	1774 (94.3%)	105 (93.8%)	
Race n(%)	White	1429 (76.1%)	88 (78.6%)	0.92*
	African American/Black	352 (18.8%)	19 (17.0%)	
	Other Races**	96 (5.1%)	5 (4.5%)	
Insurance n(%)	County***	258 (27.3%)	18 (40.9%)	0.08*
	Medicaid	289 (30.5%)	12 (27.3%)	
	Medicare	216 (22.8%)	9 (20.5%)	
	Private insurance	94 (9.9%)	5 (11.4%)	
	Self-Pay	89 (9.4%)	0 (0.0%)	
BMI, median (IQR)		34.6 (31.6, 39.5)	42.6 (36.05, 54.05)	<0.01†
Morbid Obesity (BMI>40) n(%)		507 (26.8%)	74 (66.1%)	
Comorbidities n(%)	COPD	46 (2.4%)	0 (0.0%)	0.53*
	CVD	52 (2.8%)	3 (2.7%)	
	DM	334 (17.7%)	25 (22.3%)	
	Depression	158 (8.4%)	9 (8.0%)	
	HTN	556 (29.5%)	31 (27.7%)	

BMI: Body mass index . * Fisher's exact ,† Wilcoxon rank-sum. *** Local government insurance . †† three patients excluded because they were documented as obese but their BMI in overweight category. **American Indian or Alaska Native Asian Native Hawaiian or Other Pacific Islander

Table 2, Multivariate analysis of predictors of obesity documentation

	Model 1 **OR[95% CI]** **n=1,894**	**Model 2** **OR[95% CI]** **n=1,929**	**Model 3** **OR[95% CI]** **n=1,898**
Age	0.97 [0.95 - 0.98]	0.98[0.97 - 0.99]	0.97 [0.95 - 0.98]
Female	0.58 [0.37 - 0.91]	0.59 [0.37 - 0.93]	0.58 [0.37 - 0.91]
White	1.20 [0.71 - 2.04]	1.10 [0.34 - 3.51]	1.30 [0.38 - 4.46]
Other races	0.88 [0.306 - 2.53]	1.02 [0.33 - 3.10]	1.20 [0.71 - 2.04]
Hispanic	1.12 [0.448 - 2.80]	1.10 [0.41 - 2.87]	1.08 [0.40 - 2.89]
Medicaid	0.94 [0.407 - 2.19]	1.10 [0.52 - 2.32]	0.89 [0.36 - 2.18]
Medicare	1.22 [0.491 - 3.05]	0.64 [0.24 - 1.62]	0.98 [0.380- 2.54]
Private	0.63 [0.17 - 2.25]	0.68 [0.25 - 2.54]	0.64 [0.13- 3.01]
COPD	0.57 [0.07 - 4.38]	1.42[0.21 - 9.28]	
Diabetes mellitus	1.46 [0.33 - 6.47]	1.58[0.35 - 7.17]	
Depression	1.38 [0.29 - 6.61]	1.76[0.36 - 8.61]	
Hypertension	1.40 [0.32 - 6.13]	1.45[0.32 - 6.51]	
Cardiovascular disease	1.42 [0.22 - 9.05]	1.11[0.24 - 5.03]	
BMI	1.00 [0.99 - 1.00]	1.00 [0.99 - 1.00]	1.00 [0.99 - 1.00]
Morbid obesity		1.68[1.46 - 1.93]	1.60 [1.39 - 1.84]
Number of Comorbidities			1.33 [1.03 - 1.73]

Note. Multivariate logistic regression, three statistical models were run for sensitivity analysis. All models included the baseline characteristics as covariates, including age, gender, race, and type of insurance, in addition to BMI-related variables. In model 1, we included BMI as a continuous variable; in model 2, we included morbid obesity status [BMI≥40] in addition to BMI; and in model 3, we included BMI, morbid obesity status, and the total number of comorbidities as covariates. Odd ratio with 95% confident interval OR [95%] was calculated for variables in the model.

REFERENCES:

1. Ogden CL, Carroll MD, Kit BK, Flegal KM, Study C, States U, Jama, 17. JF-djEJ. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. JAMA2012 Feb 1;307(5):483-90.

2. Yang L, Colditz GA. Prevalence of Overweight and Obesity in the United States, 2007-2012. JAMA Intern Med. [Research Support, N.I.H., Extramural
Research Support, Non-U.S. Gov't]. 2015 Aug;175(8):1412-3.

3. Teuner CM, Menn P, Heier M, Holle R, John J, Wolfenstetter SB. Impact of BMI and BMI change on future drug expenditures in adults: results from the MONICA/KORA cohort study. BMC health services research. [Research Support, Non-U.S. Gov't]. 2013;13:424.

4. Li Q, Blume SW, Huang JC, Hammer M, Ganz ML. Prevalence and healthcare costs of obesity-related comorbidities: evidence from an electronic medical records system in the United States. J Med Econ2015 Sep 4:1-9.

5. Cawley J, Meyerhoefer C. The medical care costs of obesity: an instrumental variables approach. J Health Econ2012 Jan;31(1):219-30.

6. Marcotte L, Seidman J, Trudel K, Berwick DM, Blumenthal D, Mostashari F, Jain SH, Research Support N-USGt, States U, medicine Aoi, 10.1001/archinternmed.2012.872. AIMM-d. Achieving meaningful use of health information technology: a guide for physicians to the EHR incentive programs. Arch Intern Med2012 May 14;172(9):731-6.

7. ES B, A G, C F. Adding obesity to the problem list increases the rate of providers addressing obesity. Fam Med. [Randomized Controlled Trial]. 2013 Oct;45(9):629-33.

8. Davis NJ, Emerenini A, Wylie-Rosett J, States U, educator TD, Jul-Aug;32(4):557-61. DE. Obesity management: physician practice patterns and patient preference. Diabetes Educ2006 Jul-Aug;32(4):557-61.

9. Bordowitz R, Morland K, Reich D, Study M, States U, medicine F, Apr;39(4):274-9. FM. The use of an electronic medical record to improve documentation and treatment of obesity. Fam Med2007 Apr;39(4):274-9.

10. Banerjee ES, Gambler A, Fogleman C, Trial RC, States U, medicine F, Oct;45(9):629-33. FM. Adding obesity to the problem list increases the rate of providers addressing obesity. Fam Med2013 Oct;45(9):629-33.

11. Brown I, Thompson J, Tod A, Jones G. Primary care support for tackling obesity: a qualitative study of the perceptions of obese patients. Br J Gen Pract2006 Sep;56(530):666-72.

12. Forman-Hoffman V, Little A, Wahls T. Barriers to obesity management: a pilot study of primary care clinicians. BMC Fam Pract2006;7:35.