TexMed 2016 Quality Research Abstract

Please complete all of the following sections.

Procedure 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.
- 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: The prevalence of obesity documentation in primary care electronic medical records: Are we acknowledging the problem?

Institution or Practice Name: Wichita Falls Family Practice Residency Program

Setting of Care: Outpatient Clinic

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Is the Primary Author, Secondary Author or Member of Project Team a TMA member (required)?
    X Yes ☐ No
Please provide name(s): Click here to enter text.

Project Category: *(Choose most appropriate category)*
☐ Patient Safety   ☐ Patient Centered Care   ☐ Timeliness
X Efficiency   ☐ Effectiveness   ☐ Equity
☐ **Enhanced Perioperative Recovery/Future of Surgical Care program**

For this poster session, TMA is looking for 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

Quality Research

Introduction (15 points max): *Describe 1) where the work was completed; 2) what faculty/staff/patient groups were involved, and 3) sufficient background information provided to establish the significance of the problem.*

1) The study took place in Wichita Falls Family Practice Clinic, a host for a private family medicine residency program with six faculty members and a total of 24 residents in three post graduate levels. The clinic is located in the city of Wichita Falls with a population of approximately 104,553, the center of Wichita County which is considered a population center of North Texas. The clinic accommodates approximately 10,000 visits per year, the majority of which are covered by Medicaid and county insurance.

   The clinic uses e-MD $^©$ as its EHR system. This system was introduced to the clinic in 2009. e-MD is a certified EHR system that includes appointment management, clinical notes, labs and billing among other features. For each visit, the nurse charts the main reason for the visit in addition to manually enter vital signs, height and weight. BMI is automatically calculated by the EHR and presented to the physician in the patient's chart as part of vital signs section.

2) A team of resident physicians used two ICD-9 codes (287.01, 287.02) to identify obese patients seen between Jan 2012 and June 2015 who had at least two visits during the study window. Only adults 18 years and older were included in the study - children and pregnant women were excluded, as strict BMI interpretation is less meaningful in these patient populations.

3) 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 with estimates ranging from $147 billion to nearly $210 billion annually(7). These costs are driven by a number of factors. First, obesity is comorbid with a number of other chronic health conditions including Diabetes Mellitus, hypertension, and heart disease. Research indicates that obese individuals are more than twice as likely to be prescribed medications to manage their medical conditions than are healthy weight individuals, resulting in 80% higher spending on prescription drugs (8). Second, obesity plays a major role in modifying treatment outcomes of comorbid chronic disease and, as a result, the cost of treating these co-morbidities is significantly higher in overweight and obese (9).

   Numerous guidelines and recommendations have been made regarding the treatment of obesity (10) (11) however, they have had little impact on the prevalence of obesity. Although empirically supported interventions have been identified, they are often not being incorporated into practice (12). In fact, a recent epidemiological study of weight counseling in primary care found that most primary care physicians (58%) performed no weight counseling for any of their patients (12). Although

there are many potential explanations for this dearth of treatment, one parsimonious explanation emerging in the literature is that physicians may not recognize the presence of obesity and/or may not consider obesity to be a primary medical problem (13-15).

Driven by the "Meaningful use" initiative from Center of Medicare and Medicaid (CMS) Electronic health records (EHR) are currently widely adopted in the ambulatory settings(16). EHR has generally improved the documentation of various health conditions particularly chronic conditions. The use of information technology to identify and mange patient with obesity have exploded in the recent years(17). Although studies have shown that implementing electronic prompts for BMI not only improved documentation of the condition but also increased the member of visits and the counseling (18) (15), a recent systematic review showed that few studies have examined if EHR provided clinicians the tools to screen and address overweight and obesity (17). Findings from this limited research indicate that obesity documentation rates remain low (13-15)

The aim of this study is to examine whether the availability of the BMI in the EHR improves the documentation of obesity as a part of patient problem list, compared to other major chronic conditions (diabetes, hypertension, coronary heart disease, Depression and Chronic obstructive pulmonary disease-COPD). As a secondary aim, we examine the frequency of resource utilization by number of visits compared among different levels of BMI.

Hypothesis (15 points max): *State the pertinent research or change hypothesis. Using if/then format, describe the 1) assumption; 2) condition; and 3) prediction(s).*

Given the previous research, it was hypothesized that a significant percentage of patients meeting diagnostic criteria for obesity would not have obesity documented as a presenting problem in their medical record. Moreover, it was predicted that individuals meeting diagnostic criteria for obesity would present with significantly more medical comorbidities and would utilize services at a greater rate. Finally, it was predicted that documentation of obesity would be associated with patient weight change over time.

Methods (25 points max): *Describe the specific methods, resources, procedures, models and/or programs used to study and test the subject of the investigation. Note charts, graphs and tables here and send as addendum with abstract form.*

The research team used two ICD-9 codes (287.01, 287.02) to identify obese patients seen between Jan 2012 and June 2015 who had at least two visits during the study window. Only adults 18 years and older were included in the study - children and pregnant women were excluded, as strict BMI interpretation is less meaningful in these patient populations. Data for diet and exercise counseling were obtained manually from a randomly selected subset of the data. To validate our manual data extraction, two independent investigators, blinded to the data collection results, extracted data from patient's charts. Their extraction was compared to that obtained through the database extraction. This procedure yielded a good interobserver agreement, $\kappa= 0.7$ [0.5-0.8].

Data was reported as proportions, mean±SD, or median (interquartile range). Quantitative continuous variables were analyzed using the unpaired Student's t-test or the Mann-Whitney U test. Qualitative or categorical variables analyzed using the chi-square test or Fisher's exact tests. Matched paired analysis was used for the difference in BMI by visits intervals and the *P*-value was calculated using Wilcoxon Signed Rank test. JMP statistical software © (Version 11, SAS Institute) was used for all data analyses.

Results (25 points max): *Specifically explain what was discovered, accomplished, collected and/or produced; supports hypothesis and conclusions with adequate evidence and includes quantitative data. Note charts, graphs and tables here and send as addendum with abstract form.*

During the study period, a total of 10,540 medical records were extracted and 3,868 patients were included in the study. These patients made 15,790 office visits during the study period with Median of 2. The patient sample had a median age of 52 and median BMI of 30. The sample was comprised primarily of White patients (75%) and patients who have Medicare/Medicaid (52%).

The prevalence of obesity using electrically calculated BMI was 2003 (52 %) patients; however, only 115 (3%) patients were documented as obese corresponding to 714 visits. Among those with obesity documentation, dietary counseling was documented for in 34 patients (30%) and any exercise counseling for 46 patients (40%). In a random sample of 285 obese patients without obesity documentation the mention of any diet or exercise counseling were 90 (31%) and 83 (29%), respectively.

Compared to those with BMI<30, the presence of obesity was significantly associated with increased rates of hypertension [62% vs. 38% (*P* value <0.01)], diabetes [70% vs. 30% (*P* value <0.01)], and heart disease [58 % vs. 42% (*P* value <0.01)] . However, there was no association between obesity and depression [50% vs. 50% (*P* value =0.19)] or chronic obstructive pulmonary disease [54% vs. 46% (*P* value =0.67)]. Analysis of the number of visits associated with these comorbidities across different BMI cutoffs (BMI <30, BMI 30-39.9 and BMI > 40) indicated more visits corresponding to higher BMI for each co-morbid condition.

Among those with documented obesity (N=115), the number of visits increased with the increase in BMI, however, when categorized by 3-5, 6-12 and >12 months intervals, the difference in BMI over time showed an increased mean difference 95%CI were 0.24 (-1.6-2.1) *P* value =0.84 , 1.74 (-0.84-4.32) *P* value =0.17, 1.5 (0.55-2.62) *P* value <0.01* for the three intervals respectively.

Conclusions (20 points max): *Provide a succinct interpretation of the results and evaluate what the results mean to the investigation, OR evaluate the relevance or uniqueness of what was accomplished in the immediate context of the project's purpose and describe how the investigation fits within a larger field.*

Several important findings were replicated in the current study. First, we replicated the finding that the presence of obesity is associated with an increased prevalence of additional chronic comorbidities. Second, we replicated the finding that the presence of obesity is associated with increased service utilization. Third, and perhaps more importantly, we replicated previous findings demonstrating that obesity is rarely documented in the medical records as a primary medical problem.

Our findings are minimally better than those from previous studies using hospitalized patients. For example, Azhdam et al found that less than one percent (<1%) of hospitalized obese and overweight had any documentation at their discharge summary, furthermore, "only 13.2% had documentation of weight status noted anywhere in their medical record" the authors noted (19). Others reported even lower rates with only "1.7%" of hospitalized obese patients having the diagnosis at discharge (20). Similarly, low documentation rates have also been found in outpatient samples (14, 15). Finally, consistent with previous research, we found that documentation of obesity as a medical problem was associated with greater physician attention, specifically an increased prevalence of exercise counseling (21). Banerjee et al has found that about one third of obese patients by BMI had obesity diagnosis in their problem list and concluded that adding the diagnoses of obesity to the problem list led to significant improvement in addressing it (15). Furthermore, Bordowitz et al. showed less than a third of obese patient in two family medicine clinics had related diagnosis in their problem list (14).

Interestingly, contrary to previous research reporting significant reductions in BMI as a result of documentation and clinical attention, the current study demonstrated increased BMI over time. This contrary finding may be due to the fact that clinical attention in the current study was primarily exercise counseling and was less likely to be dietary counseling. Empirical evidence has shown that documentation of obesity in the medical records indicated that physicians pay more attention and resulted in addressing it in clinical settings (15). However, in the present study, only a third of primary care visits included counseling for diet. While it was not feasible to examine the time allocated for counseling in our study, it has been shown that only 1.75 minutes (8.0%) of total office visit time was related to overweight and obesity counseling(22).

The US Preventive Services Task Force (USPSTF) set guidelines for primary care clinics and recommended that screening for obesity using BMI should be done for all adults. In addition, the American Academy of Family Physicians agreed with the USPSTF guidelines and recommended that intensive counseling and behavioral interventions should be offered to adults diagnosed with obesity(23). The most recent recommendations in 2015 form American College of Cardiology/American Heart Association and The Obesity Society (ACC/AHA/TOC), introduced five major areas for obesity management in adults, starting with identifying those at

risk , physician counseling and guidelines for treatment using diet, lifestyle intervention, and surgery (24). These new recommendations serve as a roadmap providing primary care and family physicians with the current evidences to incorporate them in their practice (25)

Multiple barriers were identified that could have contributed to the lack of addressing obesity as a separate medical condition rather than a sequelae. Patients may have been deterred from discussing their obesity with their primary care physician due to their ambivalence about the treatment options and stigmatizing emotional state (21). On the other hand, some reports suggest that the lack of knowledge and familiarity with guidelines is another reason for physician to shy away from addressing the problem (26). A recent study suggested that more educational programs are needed to improve physician knowledge and competency in treating patients with obesity (27). This body of research also shows that education is associated with the delivery of higher quality of counseling (28).

Our study has several limitations; first the retrospective nature of our study will not infer to causal effect and limits our analysis to association. Second; we used the problem list as a surrogate for addressing the problem as part of the clinical encounter; there could have been counseling related to the problem that was verbally done and not documented in the medical records. Although this may have been the case in our study, it would not explain the low prevalence in obesity documentation in our study. Additionally, although defining obesity by patient BMI has been validated and is widely accepted at both the individual and population level, it has some limitations; primarily BMI might not reflect the actual body fat component particularly for those in the overweight category(29). Finally, the fact that this was a single center study limits the generalizability to similar setting and population.

In conclusion, these findings, together with the existing literature, suggest that obesity is generally not recognized as a primary medical problem. As a result, counseling is provided infrequently, perhaps because of the lack of structural approach to the problem. Additionally, obesity is associated with an increase in the prevalence of comorbid conditions and associated service utilization. However, higher numbers of visits might not positively impact patient BMIs. Continued research is needed to identify effective methods for physician counseling and behavioral therapy approaches in the treatment of obesity.

Table1: Baseline characteristics

Characteristics		Summary *
Age median IQR		52 (42,59)
Female gender n(%)		2147 (55)
Ethnicity n(%)	Not Hispanic or Latino	3630 (93)
	Hispanic or Latino	214 (6)
	Declined	24 (0.1)
Race n(%)	White	2903 (75)
	African American	709 (18)
	Declined/Others	200 (5)
	Asian	45 (1)
	American Indian or Alaska Native	11 (0.2)
Insurance n(%)	Medicaid	1175 (30)
	Medicare	858 (22)
	Private insurance	334 (8)
	Self-pay	238 (6)
	Null /Others	1263 (32)
BMI median IQR		30 (25,36)
Chronic Comorbidities n(%)	Diabetes mellitus	776 (20)
	Hypertension	1511 (39)
	Heart disease	178 (4)
	COPD	196 (5)
	Depression	608 (15)

N (%) or median (IQR) unless specified

Figure 1, study chart.

Figure 1 study chart

Total screened
medical records
10540

Exclude
1970   < 18 years old
1005   No height or weight available
45   Pregnant women
3652   <2 visits per study period**

Total Patients included
in the study
3868

Patients with BMI $\geq$ 30
2003 (51.7 %)

Obesity not charted
in the problem list
1888 (94%)

Obesity charted
in the problem list
115 (6%)

** These include; administrative visits, walk in, immigration, sport 's physicals and disability evaluations.
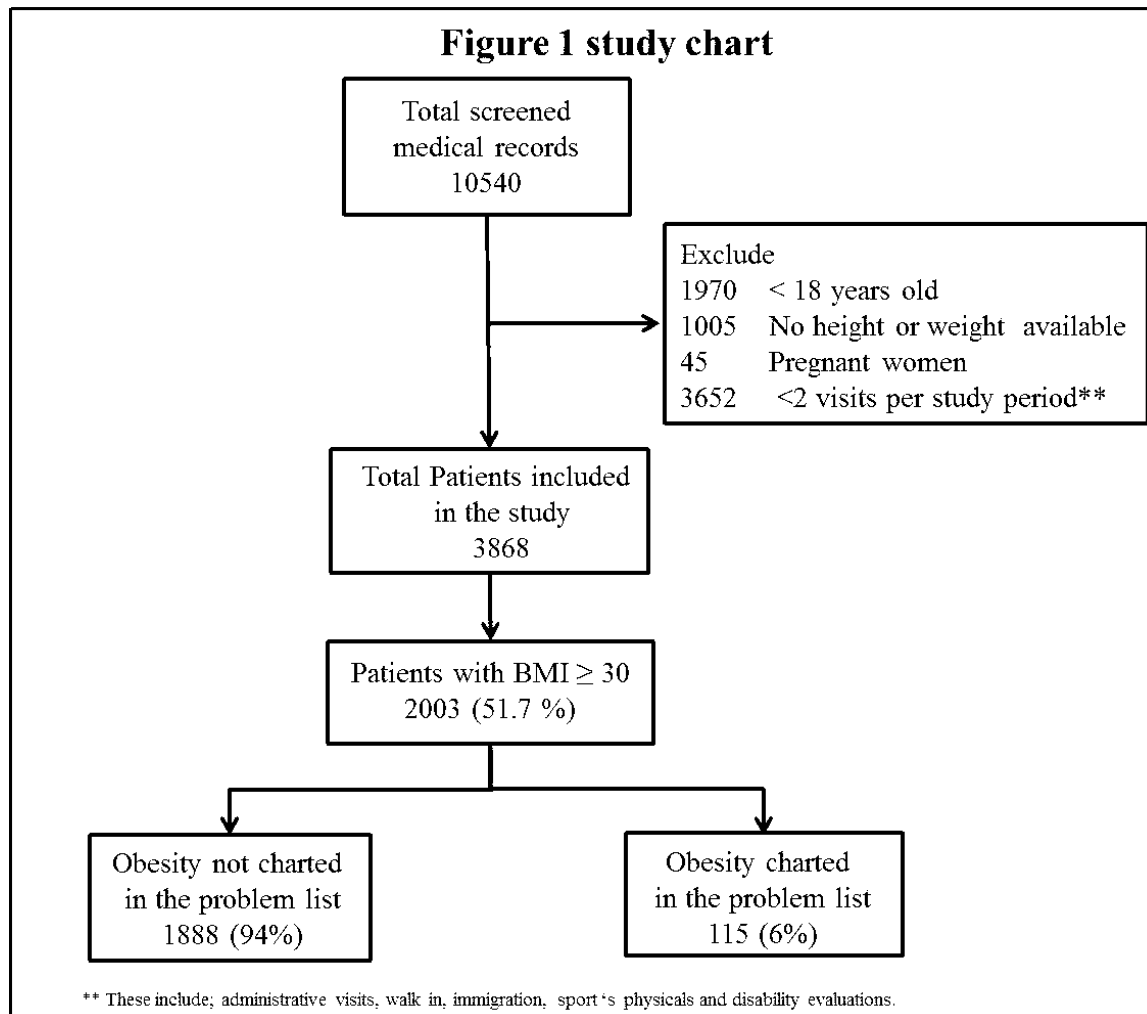
Figure 2 The number of visits for selected comorbidities for those with BMI <30, BMI 30-39.9 and BMI > 40, there is more visits for those with morbid obesity.
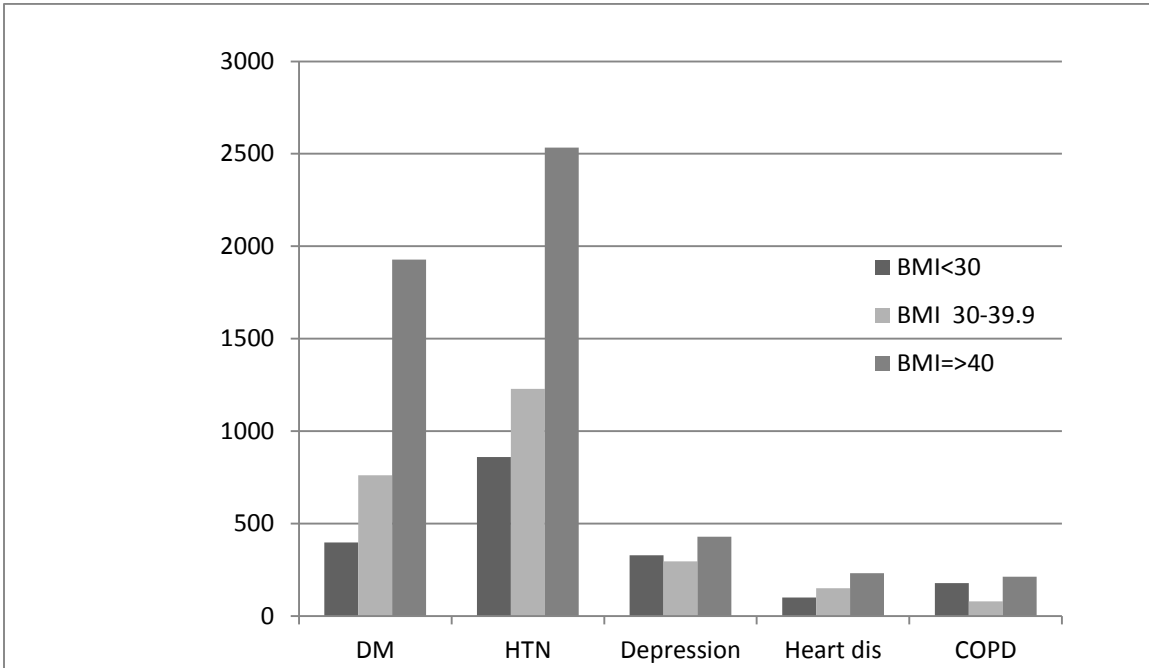
Figure 3: The box plots represent the difference in BMI number for visits interval 3, 6 and ≥12 months' intervals. The line represents the median number of visits corresponding to the same visits interval. Among those with BMI > 30, the frequency of visits increased over time, however, the overall change in BMI was positive.

Figure 3: BMI difference and number of visits by month's intervals