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### Leveraging the Electronic Medical Record to Identify Predictors of Non-Attendance to a DSME Program

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### Objectives

- Identify the patient-specific factors, easily obtainable from the electronic medical record (EMR), that are associated with non-attendance to a DSME program among an adult population with type 2 diabetes
- Discuss the research methods utilized to determine strategies for removing barriers to patients attending DSME programs
- Describe the implications of this study's findings within the larger context of diabetes self-management education programs nationally

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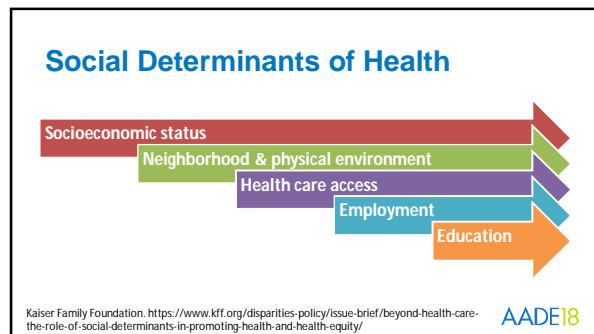
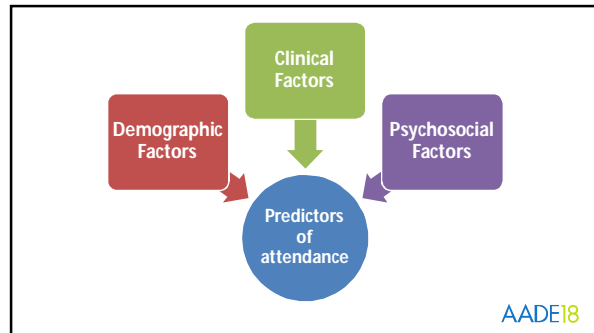
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### Background

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    graph LR
      A[ADA Standards of Care] --> B[Average absolute A1C reduction of 0.57%]
      B --> C[Low uptake by patients and payers]
      C --> D[Barriers to patient acceptance of and participation unclear]
    
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### Research Question

*What **patient-specific** factors, **easily obtainable** from the **electronic medical record (EMR)**, are associated with **non-attendance** to a DSME program among an adult population with type 2 diabetes?*

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- ### Study Design
- Retrospective, case-controlled study
  - Inclusion criteria:
    - ≥ 18 years old
    - Non-pregnant
    - Type 2 diabetes
    - Scheduled for group DSME session (Nov 2013-Jun 2017)
  - Binary logistic regression
    - Attend: Yes/No
  - Class 1 attendance
    - Reschedules vs. no-shows & cancellations
  - IRB/Privacy Board:
    - Determined exempt by the UMKC Institutional Review Board and Truman Medical Centers Privacy Board
  - Overall "N" = 1375
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### Demographic Factors

Patient Characteristic	OR	95% CI	P-value	Interpretation
Increased Age	1.024	(1.01-1.03)	<0.001	Each additional year increased likelihood of attendance by 2.4%
Age ≥ 55	1.577	(1.27-1.96)	<0.001	Patients under 55 (n=709) were 42.3% less likely to attend than older patients (n=666)
Male Gender	1.013	(0.81-1.26)	0.911	No difference between males (n=550) & females (n=825)
Caucasian Race	1.082	(0.84-1.38)	0.534	No difference between Caucasians (n=363) & African Americans (n=909)
Distance from Clinic	1	(0.98-1.02)	0.959	Calculated using the geographical center of each zip code

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### Clinical Factors

Patient Characteristic	OR	95% CI	P-value	Interpretation
# of Meds	1.005	(0.986-1.024)	0.597	No correlation between number of medications and attendance
Diabetes Meds	0.941	(0.62-1.429)	0.776	No correlation between prescription for diabetes medicines (n=1277) and not being on diabetes medicines (n=98)
# of DM Meds	0.873	(0.769-0.99)	0.034	Of patients taking diabetes medicines, each additional medication prescribed decreased the likelihood of attendance by 12.7%
Metformin	1.355	(1.085-1.691)	0.007	Patients with a prescription for metformin (n=871) were 35.5% more likely to attend than those without (n=502)

### Psychosocial Factors

Patient Characteristic	OR	95% CI	P-value	Interpretation
Follows with endocrinologist	0.919	(0.72-1.18)	0.502	Patients with an endocrinologist visit in the past 12 months (n=343) compared to those without one (n=1032)
Required copy for DSME	0.624	(0.49-0.79)	<0.001	Patients with a copy (n=452) were 37.6% less likely to attend than those without one (n=744)
Insurance	0.866	(0.69-1.08)	0.202	Patients with insurance (n=855) compared to those without (n=520)
Socioeconomic status	0.695	(0.54-0.90)	0.006	Medicaid & TMC Discount patients (n=994) were 30.5% less likely to attend than those with Medicare or commercial insurance (n=332)

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### Clinical Factors

Patient Characteristic	OR	95% CI	P-value	Interpretation
Insulin	0.57	(0.456-0.714)	<0.001	Patients prescribed insulin (n=659) were less likely to attend than patients prescribed other diabetes medications (n=618)
Bolus insulin	1.486	(1.046-2.11)	0.027	Patients prescribed bolus insulin (n=486) were 48.6% more likely to attend than patients on other types of insulin (n=173)
TDD Insulin	0.997	(0.994-0.999)	0.036	Each additional unit of insulin decreased the likelihood of attendance by 0.3%
TDD insulin > 0.6 units/kg/day	0.759	(0.559-1.031)	0.077	No difference between patients on more than 0.6 units/kg/day (n=337) and those taking less (n=322)

### Clinical Factors

Patient Characteristic	OR	95% CI	P-value	Interpretation
A1C	0.957	(0.919-0.997)	0.035	Each 1% increase in A1C decreased likelihood of attendance by 4.3%
A1C ≥ 8.5%	0.782	(0.629-0.973)	0.027	Patients with a baseline A1C ≥ 8.5% (n=728) were 21.8% less likely to attend than an A1C below 8.5% (n=622)
CKD	1.328	(0.968-1.822)	0.079	No difference between patients with a GFR 60 or less (n=178) and those with a GFR over 60 (n=1157)
BMI	1.001	(0.989-1.014)	0.876	No correlation between BMI and attendance

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### Conclusions

- Increased likelihood:**
  - Older age (especially ≥ 55)
  - Prescription for metformin
  - Prescription for bolus insulin (compared to patients on other insulins)
- Decreased likelihood:**
  - Higher A1C (especially ≥ 8.5%)
  - Required copy for DSME
  - Low socioeconomic status
  - Increased number of diabetes medicines (vs. all patients on diabetes medicines)
  - Prescription for insulin (vs. other diabetes medicines)
  - Higher total daily dose of insulin

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### Limitations

- Regression analysis
- Validity of electronic medical record
- Lack of prescription fill histories
- Other factors within EMR but difficult to extract

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