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A Call to Action: It's Time for Diabetes Educators to Do Something About Hypoglycemia!

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- Notice of Requirements For Successful Completion
 - Please refer to learning goals and objectives
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 - Jan Kavookjian, MBA, PhD, FAPHA - Merck Speakers Bureau for non-product topics in education and person-centered communication; motivational interviewing content consultant for Merck; motivational interviewing training consultant for Medemergent.
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Objectives

Upon completion of this presentation, participants will be able to

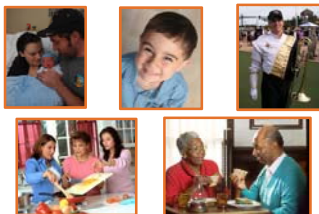
1. Describe patient, social, and treatment-associated factors that place people at risk for hypoglycemia across the lifespan
2. Discuss existing evidence that support the role of DSMES in reducing hypoglycemia events as well as clinical, psychosocial and humanistic outcomes.
3. Utilize systematic review findings to identify opportunities for diabetes educators to expand the body of literature addressing best practices in DSMES that improve hypoglycemia-associated clinical outcomes in varied populations.

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Background – Scope of Problem

Hypoglycemia places people with diabetes (PWD) at risk across the lifespan, diabetes types, ethno-racial backgrounds, and economic classes.



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Background – Scope of Problem

- People with T1D experience more episodes of hypoglycemia.
 - 92.3% of people with T1D (Aronson et al., 2018).
- Hypoglycemia actually affects more people with T2D.
 - 63.6% of insulin-treated people with T2D (Aronson et al., 2018).
 - 45% prevalence of mild/moderate and 6% prevalence of severe hypoglycemia (Eldridge et al., 2015).
- Hospitalization for hypoglycemia more common in older adults and African Americans (Lipska et al., 2014).

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Background: Scope of Problem

- 14.1 million annual ED visits by PWD (CDC, 2007)
 - 245,000 are result of hypoglycemia (CDC, 2017)
- Pharmacologic causes of emergent hospitalization:
 - Insulin = 13.9%
 - Oral agents = 10.7%
- For Medicare patients admitted with hypoglycemia:
 - 18% will be readmitted within 30 days.(Lipska et al., 2014)
 - 23.3% will die within one year.(Lipska et al., 2014)

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Background: Causes of Hypoglycemia



Food



Fitness



Pharmaceuticals

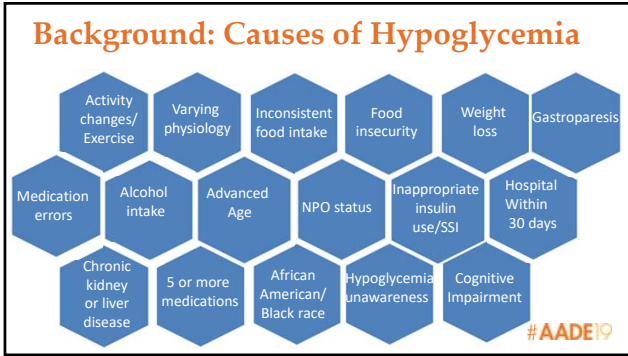
Physiology



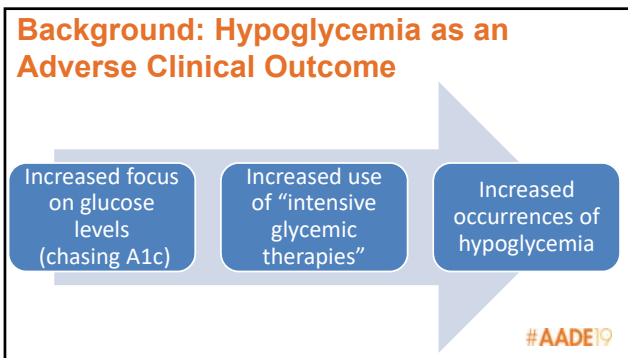
Social Determinants of Health

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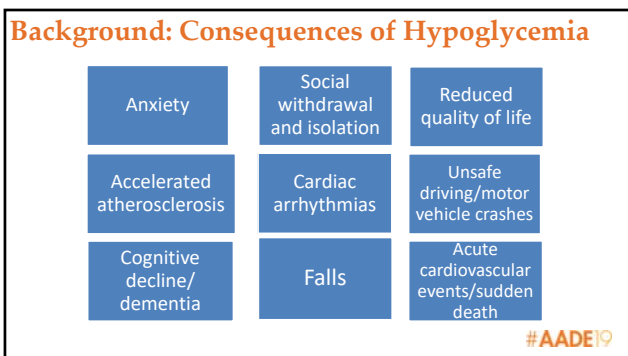
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Background: Scope of Problem - Community

- Actual rates of hypoglycemia are underestimated:
 - Inconsistent clinical definitions
 - Inadequate report of mild/moderate reactions
 - Use of ED data to capture hypoglycemia
 - Varied terminology
 - Lack of uniform measures
- Responsibility for prevention, recognition, and treatment of hypoglycemia rests with PWD and family supports.




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Background: Scope of Problem - Hospital

- Patient characteristics:
 - Older age
 - Cognitive dysfunction
 - Low BMI
 - Long disease duration
 - Cerebrovascular disease
 - Chronic kidney disease
 - A1C > 9%
 - Insulin treatment (Borzi et al., 2016; Akirov et al., 2018)
- Risk increases by 11% with each decade of life. (Akirov et al.)



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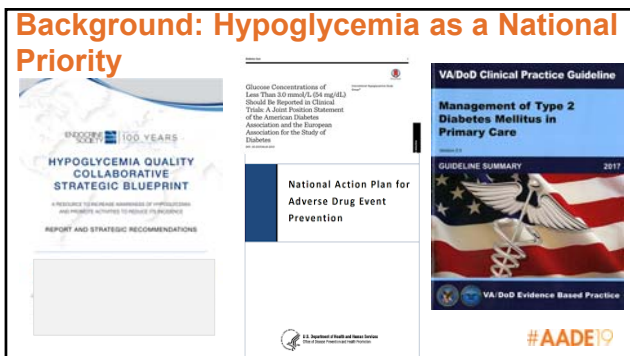
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Background: Scope of Problem - LTC

- 25-35% of LTC residents have diabetes (Munshi et al, 2016; Newton, et al., 2013).
- Hypoglycemia occurs in 40% of LTC residents with diabetes, most treated with insulin (Newton et al., 2013).
- LTC residents with history of diabetes experience:
 - Greater emergency department utilization
 - More hospitalizations
 - Greater mortality (Newton et al, 2016).

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Unifying Themes

- Hypoglycemia is a significant, potentially fatal consequence of diabetes treatment.
- Uniform definition of hypoglycemia is required.
- Improved measurement of hypoglycemia-related outcomes is required.
- DSMES should be included as a risk reduction strategy.

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The Problem:

- There is a need to report evidence and gaps in the literature that describe the impact of DSMES on hypoglycemia risk mitigations.

A First Step:

- A systematic review of well-conducted studies examining the impact of DSMES on hypoglycemia outcomes.

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Study Purpose

- Primary Objective:
 - To report evidence and gaps in the literature among well-conducted studies looking at the impact of diabetes education on hypoglycemia outcomes
 - Goal – to describe best practices and inform future study.
- Secondary Objective:
 - describe the reported impact of DSMES on associated intermediate (behavior change and knowledge gain), clinical, humanistic, and economic outcomes of diabetes education for hypoglycemia risk/event reduction. #AADE19

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Methods

- Systematic review using modified Cochrane methodology.



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Inclusion Criteria

- DSMES identified as the sole intervention or as a key component of a combined intervention
- Description of a directly measurable outcome for hypoglycemia risk or events
- Published in English between January 2001 and December 2017
- Conducted in the United States

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Excluded Studies

- Failure to meet inclusion criteria
- Lack of abstract
- No evidence of experimental or case control design with pre/post assessment of target variables
- Qualitative studies, case reports, opinions, reviews

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Search Strategy

- Terms and derivations for “diabetes” AND
 - “education”
 - “hypoglycemia”
 - “outcomes”
- Searched databases
 - Medline (EBSCOhost), CINAHL Plus, PsycInfo, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, Web of Science, and Embase
- Hand search of relevant articles and reviews #AADE19

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Review Strategy

- Upload of records to EndNote citation management software.
- Covidence screening software used for 3-tiered review.
 - 1) Title – two researchers
 - 2) Abstract – two researchers + a third to resolve
 - 3) Full text – two researchers
- Standardized data extraction of retained studies #AADE19

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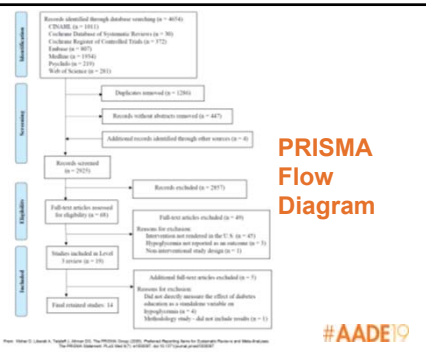
Assessment of Methodological Quality

- Joanna Briggs Institute Critical Appraisal Tools
 - JBI's Checklist for Randomized Controlled Trials
 - Checklist for Quasi-Experimental Studies
 - Checklist for Case Control Studies
- Independent methodological reviews completed by two researchers with third review for consensus.

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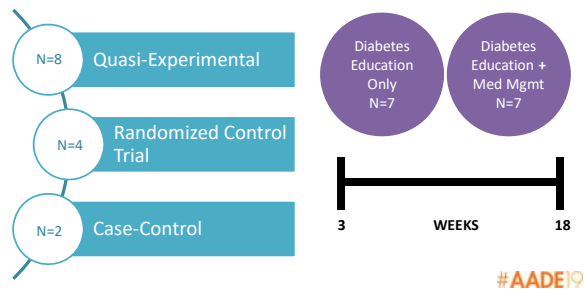
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Results: Article Selection

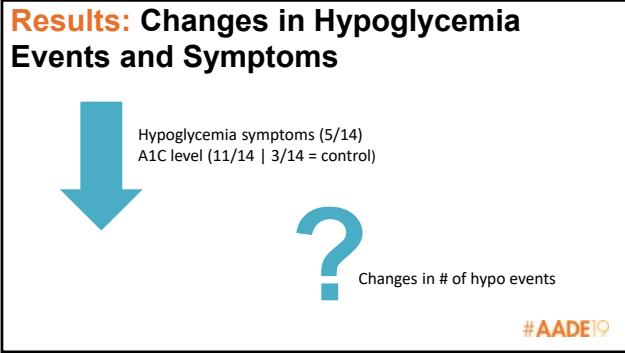


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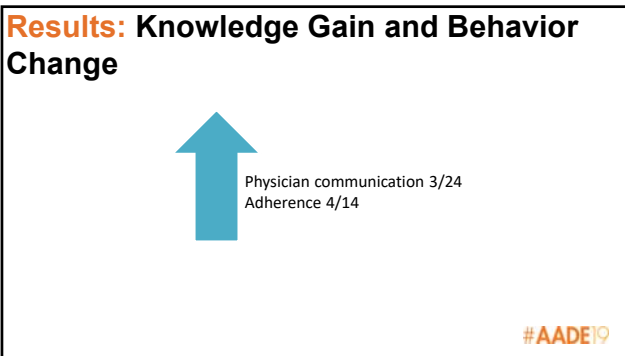
Results: Article Characteristics (N=14)



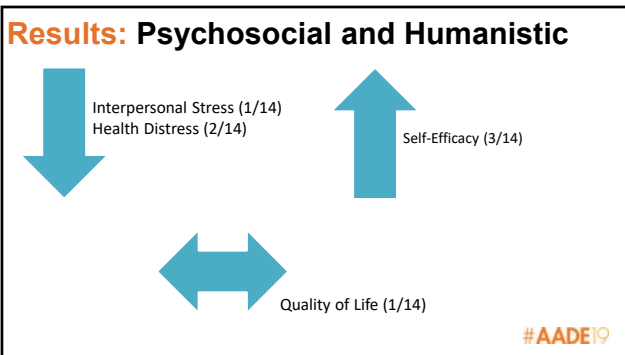
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Results: Economic/Utilization Outcomes

Office/ER visits (1/14)

All cause office visits (1/14)

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Results: Review of Methodological Quality

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Better evidence. Better outcomes.

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Discussion

- Impact of diabetes education on hypoglycemia outcomes
- Real-world scenarios
- Age groups

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Implications for Research

- We need more studies!
- We need better descriptions of DSMES!
- We need more consistent terminology!
- (We need less hypoglycemia.)



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Implications for Research

- Outcomes
 - Hypoglycemia events vs. hypoglycemia symptoms
 - “Glycemic control”



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Implications for Research

- Include participants representing more diverse populations
- And age groups
- Target at-risk populations
- Study acute care, long term care, pediatric ambulatory care



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Implications for Practice

- Survival skills
- Risk reduction
- Teach back
- Symptoms
- Terminology
- Project Vision



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Limitations

- Only English
- Only United States
- Mostly adults
- Missing information on
 - Duration of diabetes
 - Prior history of DSMES
 - Prior experience with hypoglycemia
- Lacking description of DSMES interventions
- Short intervention durations



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Conclusions

- DSMES is an important resource for reducing hypoglycemia risk and incidence
- We need more and better research
- We need to promote a common understanding (and utilization) of DSMES



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Questions?

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