The role of DSMES in Diabetes Care

Renovating Diabetes Education

Gabric Diabetes Education Association

Nov 2025

International Diabetes Federation Member

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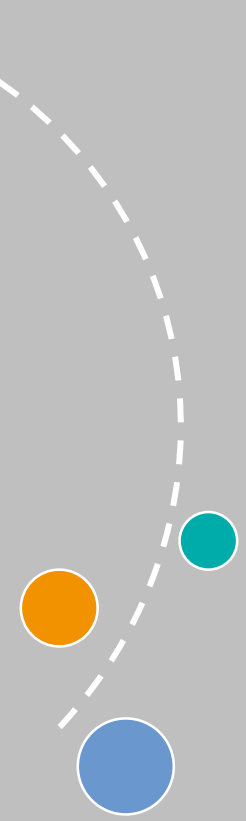
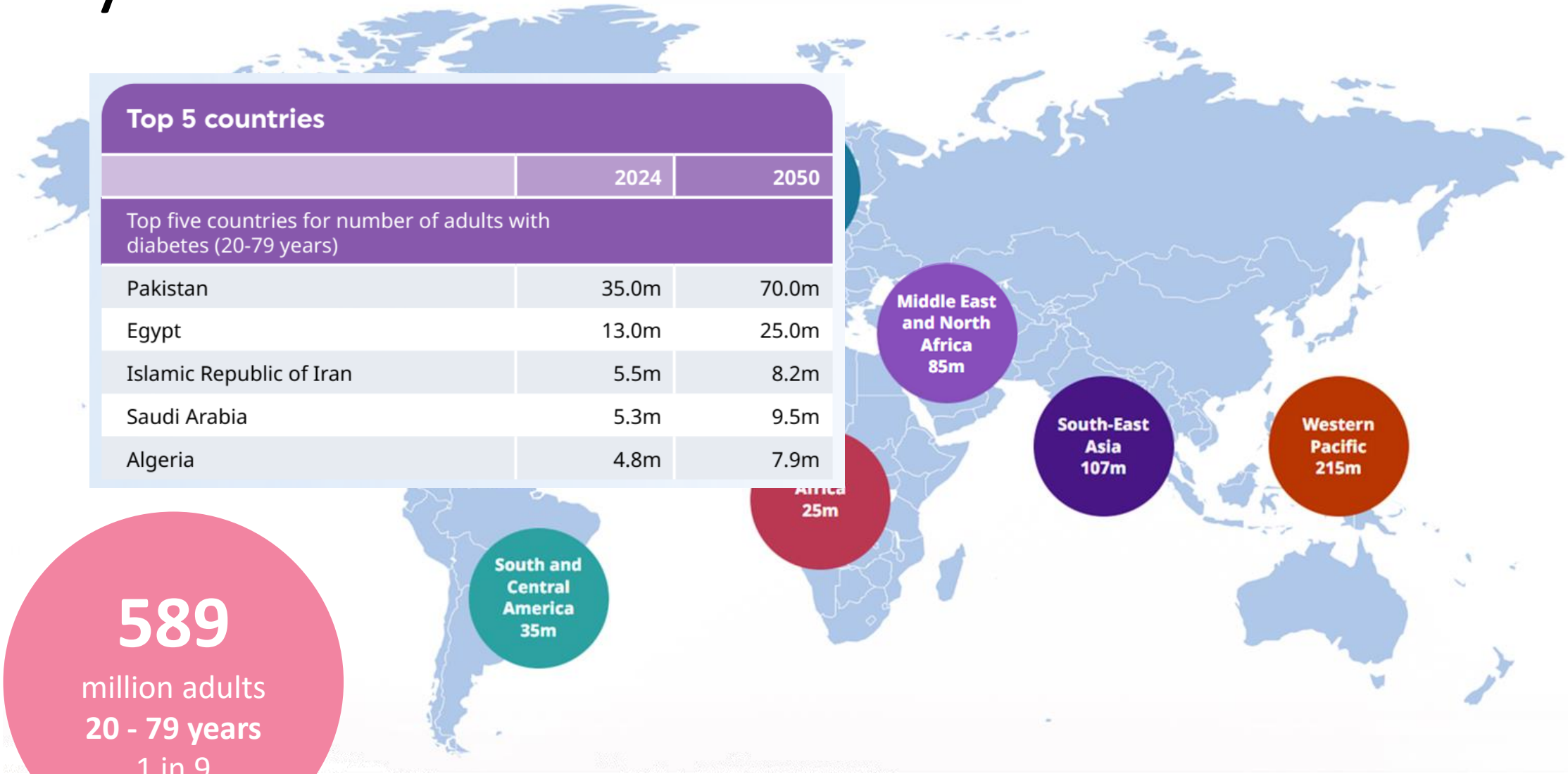
Presentation Outline

- Standards of Diabetes Self-Management and Support:
  - Why DSMES?
  - History of Diabetes Self-management
  - Patient-centered DSME
  - Gabric Diabetes School



Why do we need diabetes education?

Top 5 countries		
	2024	2050
Top five countries for number of adults with diabetes (20-79 years)		
Pakistan	35.0m	70.0m
Egypt	13.0m	25.0m
Islamic Republic of Iran	5.5m	8.2m
Saudi Arabia	5.3m	9.5m
Algeria	4.8m	7.9m



589
million adults
20 - 79 years
1 in 9

Diabetes in Iran

- Prevalence, awareness, treatment and control of diabetes among Iranian population

Khodakarami *et al. BMC Public Health* (2022) 22:1216
https://doi.org/10.1186/s12889-022-13627-6

BMC Public Health

RESEARCH Open Access

Prevalence, awareness, treatment and control of diabetes among Iranian population: results of four national cross-sectional STEPwise approach to surveillance surveys

Rahmkhoda Khodakarami[1], Zhaleh Abdi[2*], Elham Ahmadnezhad[2], Ali Sheidaei[3] and Mohsen Asadi-Lari[1,4]

Abstract

Background: Diabetes as a leading cause of death imposes a heavy burden on health systems worldwide. This study investigated the trends in prevalence, awareness, treatment and control of diabetes among Iranian population aged 25 to 65 years over 12 years (2004-2016).

Methods: Secondary data analysis was performed using data from a national population-based survey, STEPwise approach to surveillance (STEPS) for non-communicable diseases (NCDs) in four rounds (2004, 2007, 2011, 2016). The sample sizes were 89,404, 29,991, 12,103 and 30,541 individuals, respectively across the country in both rural and urban areas. Data were analyzed using descriptive statistics and a logistic regression model with odds ratio at a significance level of less than 5% with no adjustment for age and sex. Logistic regression was used to identify socio-demographic factors associated with the levels of awareness, treatment and control of diabetes mellitus.

Results: The prevalence of diabetes in four rounds was 8.4, 9, 11.1 and 13.2%, respectively. Among people with diabetes, 53.5, 65.6, 70.5 and 82.2% were aware of their condition and 35.9, 42, 46 and 39.6% were treated for this condition, respectively. In four rounds of study, 14.5, 20.8, 20.4 and 18.5% of all diabetic patients had adequate glycemic control, respectively. In the multivariable logistic regression analysis, there was a significant relationship between female gender, age over 40, living in the urban area, being in the third wealth quintile and having health insurance with diabetes prevalence. Female participants were more likely to be aware of the disease. Older participants were more likely to receive treatment and had adequate glycemic control.

Conclusion: The prevalence of diabetes in Iran has been increasing and despite the great awareness of the disease, receiving treatment and effective control of the disease are suboptimal. While several national policies to improve diabetes screening and care have been passed in recent years, it seems large gaps remain in disease detection and treatment. It is suggested that more attention be paid to the treatment and control of diabetes by NCDs national policies to prevent the growing burden associated with the disease.

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Khodakarami et al. BMC Public Health (2022) 22:1216

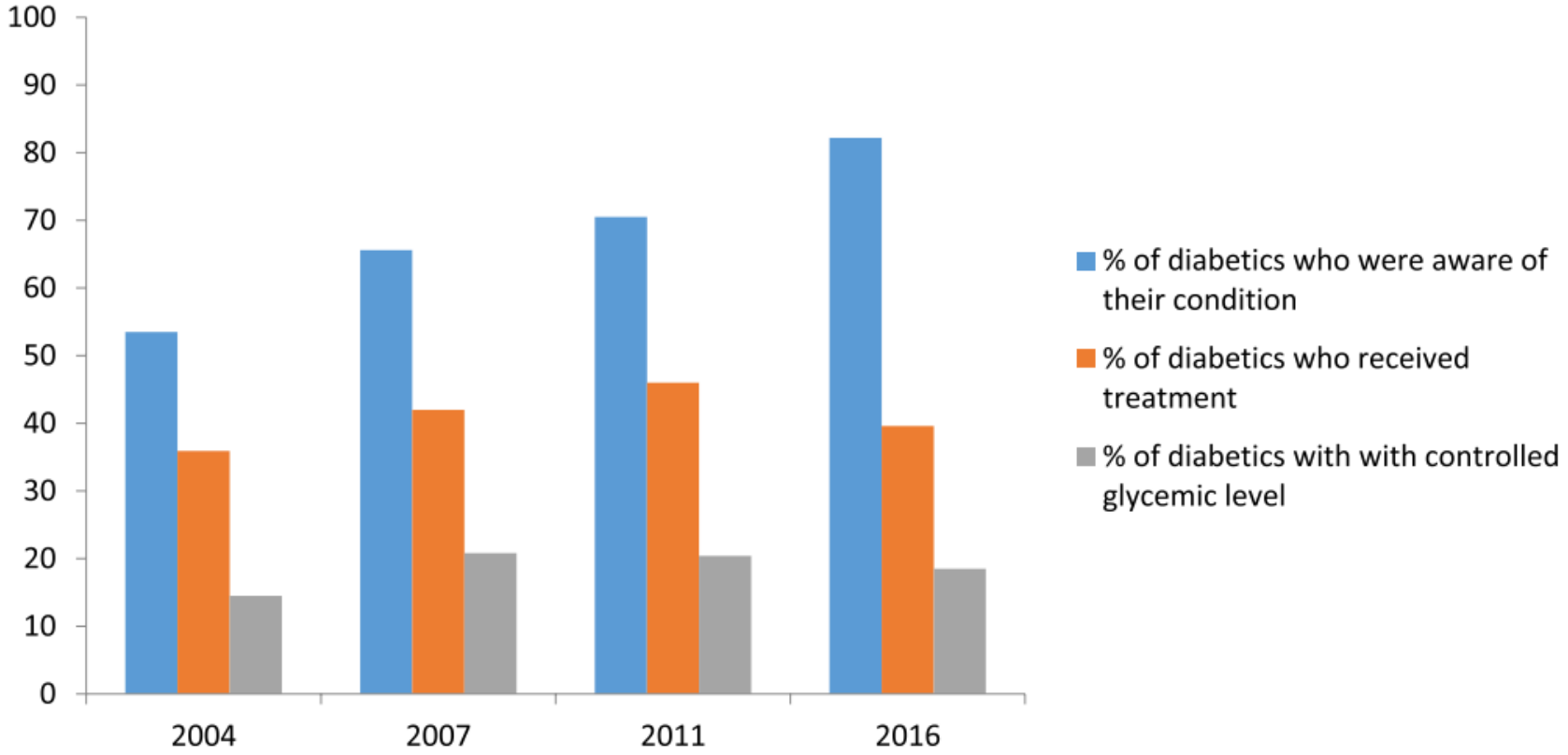
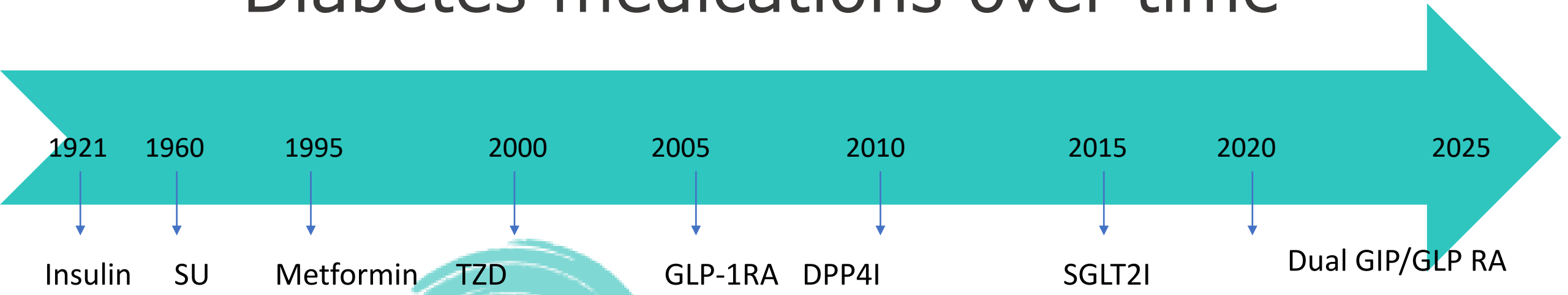


Fig. 1 Percentage of diabetes awareness, treatment and control among diabetic patients. The bar chart demonstrating % of patients who were aware of their condition, who receive treatment and who had controlled blood glucose level in 2004, 2007, 2011 and 2016 surveys (based on FBS test)

Table 2 Prevalence of diabetes among Iranian population aged 25-65 in four rounds

Variables	2004%(95%CI)	2007%(95%CI)	2011%(95%CI)	2016%(95%CI) Based on HbA1c	2016%(95%CI) Based on FBS
Total	8.4 (8.2-8.7)	9 (8.5-9.6)	11.1 (10-12.1)	13.5 (12.9-14.2)	13.2 (12.6-13.8)

Diabetes medications over time



1st Glucometer 1970

1st Insulin Pump 1978

1st CGM 1999

1st Closed Loop 2017

1st Artificial Pancreas: 1960

Even More is coming……

Kovatchev B. A Century of Diabetes Technology: Signals, Models, and Artificial Pancreas Control. Trends in Endocrinology & Metabolism. 2019;30(7):432-44.

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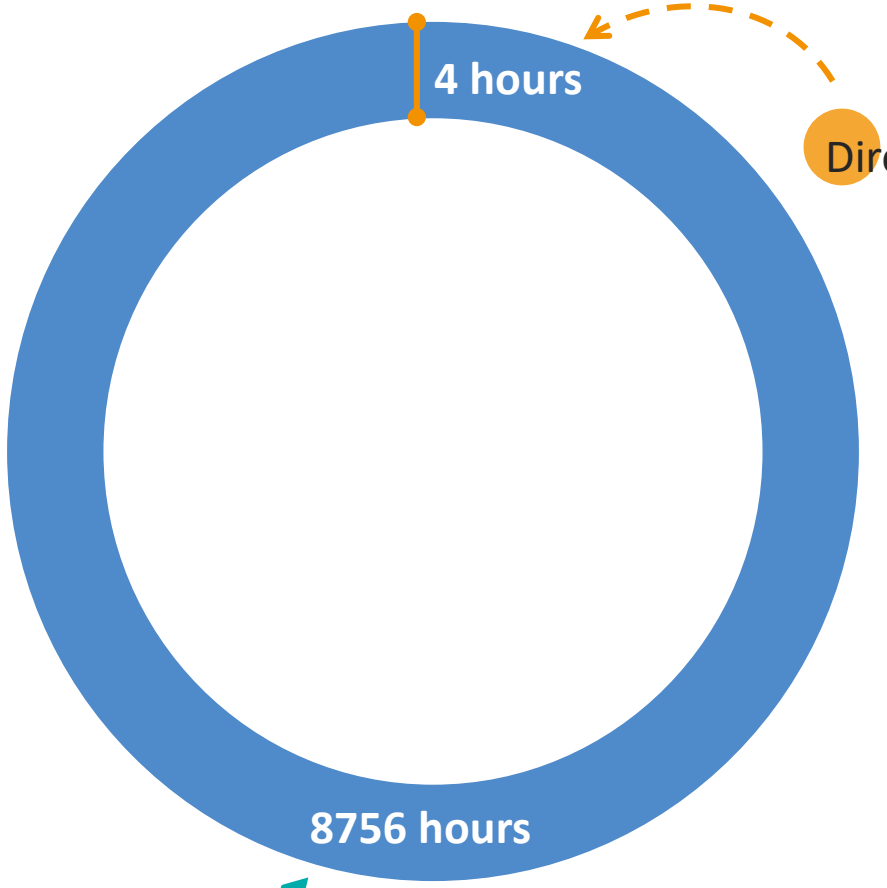
Each patient has a doctor inside them!



Direct HCP contact per year

More than 95% of diabetes care is done by the patient.

Time needed to be self-managed

More time is needed!

TABLE 1. CDE Estimation of Time Needed for Self-Care Activities for an Adult With Established Type 2 Diabetes on Oral Medications and Performing SMBG Twice Daily

ADA-Recommended Task	Time Needed ± SD (minutes)
SMBG	11 ± 26
Recordkeeping (e.g., fasting serum glucose and blood pressure)	9 ± 13
Taking medications	
Foot care	
Oral care	
Problem-solving	
Obtaining supplies	
Meal planning	21 ± 18
Shopping for food	23 ± 24
Preparing meals	54 ± 32
Exercise	32 ± 17
Stress management	16 ± 19
Support/support groups	13 ± 19
Scheduling medical appointments	9 ± 13

TABLE 2. CDE Estimation of Time Needed for Self-Care Activities for a Child (and Family) With Established Type 1 Diabetes on Basal-Bolus Insulin Therapy (Four Shots/Day) and Performing SMBG Four Times Daily

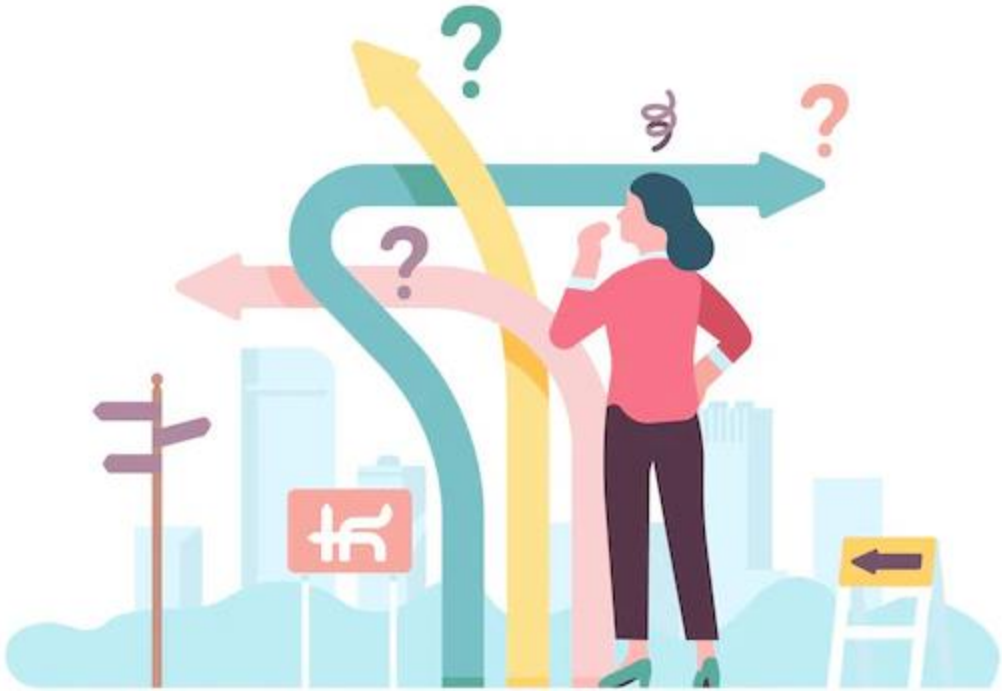
ADA-Recommended Task	Time Needed ± SD (minutes)
SMBG	17 ± 12
Recordkeeping (e.g., fasting serum glucose and blood pressure)	16 ± 18
Insulin drawing and administering	16 ± 12
	4 ± 4
	7 ± 5
	18 ± 21
	20 ± 21
	21 ± 19
Preparing meals	60 ± 265
Exercise/extracurricular activities	53 ± 31
Meal planning for school	13 ± 11
Medications for school	11 ± 11
Parental visits to school for problems (hypoglycemia/hyperglycemia)	15 ± 21
Support/support groups	14 ± 21
Obtaining supplies	11 ± 16
Scheduling medical appointments	9 ± 15

The total estimated time needed daily for recommended diabetes self-care:
~4 hours for adults and >5 hours for children

Time needed for diabetes self-care: nationwide survey of certified diabetes educators. *Diabetes Spectrum*, *31*(3), 267-271.

Extra decisions, Extra burden!

- T1DM: 180 extra decisions every day, on average



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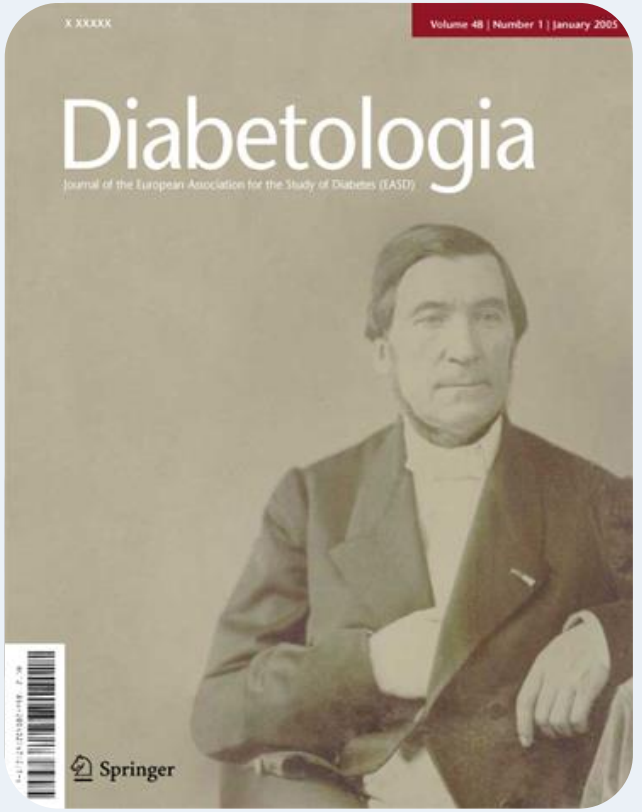
The History behind Diabetes Education

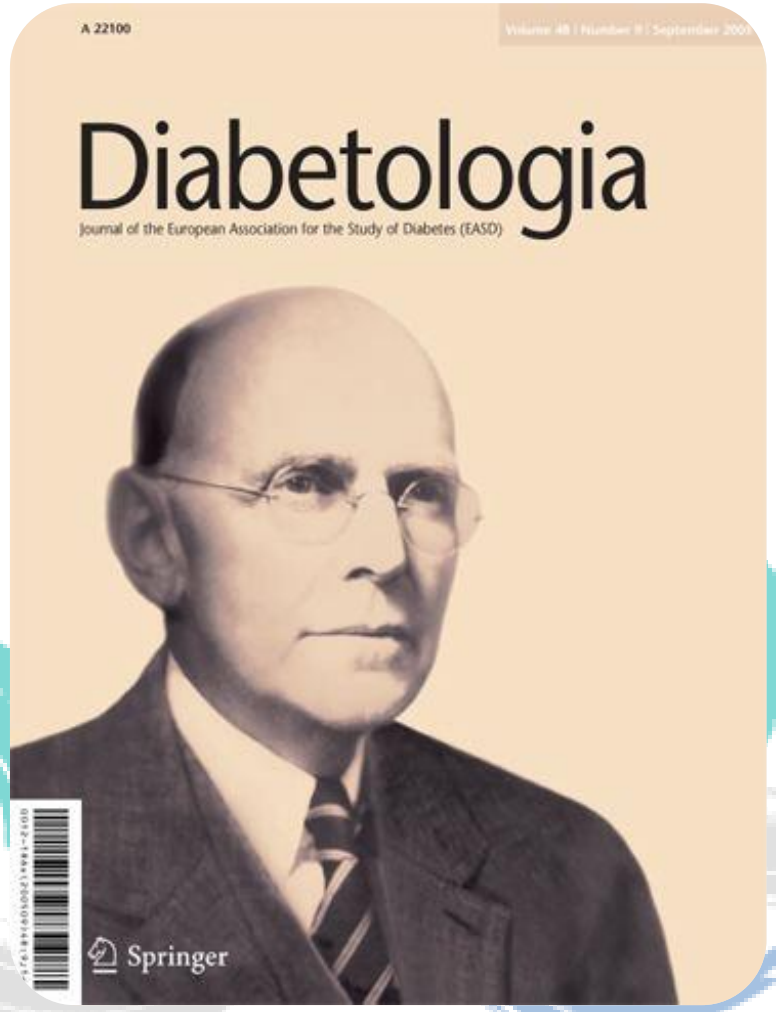
“This daily measurement of glucosuria guides patients like the compass that guides the sailor on unknown oceans”



Apollinaire Bouchardat
1806-1886

Bouchardat A (1883) De la glycosurie ou Diabète sucré son traitement hygiénique. Libraire Germer Baillière, Paris

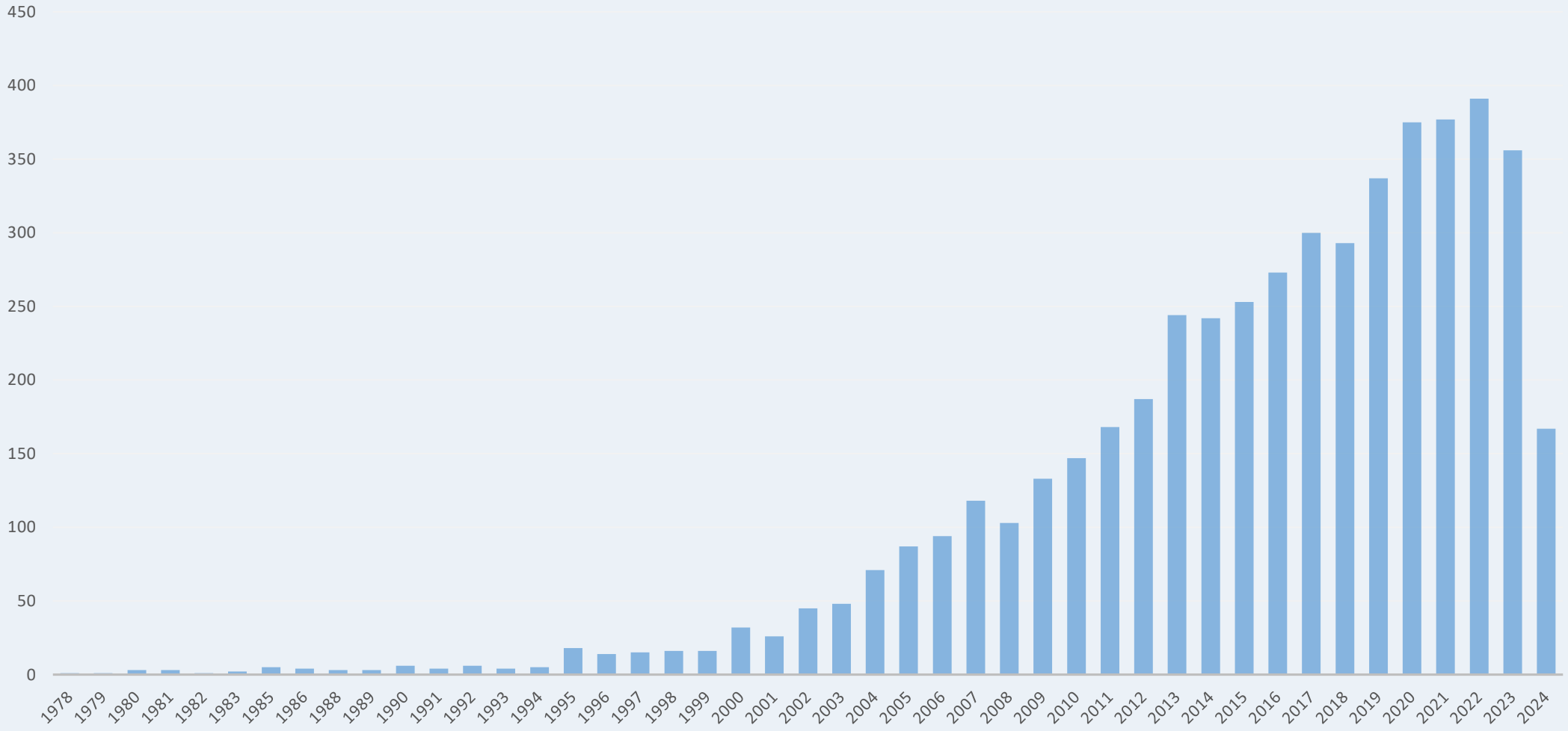
The History behind Diabetes Education



every insulin-treated patient had to be properly educated to carry out his therapy [4]. Based upon disappointing experiences with some of his very first insulin-treated patients (some of whom had discontinued their insulin injections after having been discharged from the hospital), Joslin pointed out that any insulin therapy was "a waste of time and money unless the patient was thoroughly instructed to manage his own case" [5]. In 1925, Lawrence edited a manual on "The Diabetic Life: Its Control by Diet and Insulin. A Concise Practical Manual for Practitioners and Patients" [6] and wrote in its introduction "it is the object of this book to bring modern treatment of diabetes by diet and insulin within the scope of the general practitioner and the understanding of patients whose intelligent cooperation is necessary for the best results". As early as the 1920s, systematic efforts were made to establish diabetes education programmes for the training of insulin-treated patients. Joslin created the diabetes nurse educator and the diabetes wandering nurse, specialists who delivered the educational programmes in the hospital and at the homes of the patients, respectively [7].

Assal JP, et al. Patient education as the basis for diabetes care in clinical practice and research. Diabetologia. 1985

Research Trend in Diabetes education



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Paradigm Shift in Diabetes Education

Traditional **knowledge-based diabetes education** is **essential** but **not sufficient** for sustained behavior change.

Piette, J.D., et al (2000). *Medical Care*, 38, 218–30.

Diabetes Self-management Education (DSME)

Diabetes self-management education (DSME) is the **ongoing process** of **facilitating** the knowledge, skill, and ability necessary for diabetes **self-care**.

Powers, M. A., et al (2017). The Diabetes Educator **43**(1): 40-53.

Diabetes Self-management Education (DSMS)

On-going support is critical to sustain progress made by participants during the DSME program.

Activities that assist the person with diabetes in implementing and sustaining the behaviors needed to manage his or her condition on an ongoing basis.

The type of support provided can be **behavioral, educational, psychosocial, or clinical**.

Powers, M. A., et al (2017). The Diabetes Educator **43**(1): 40-53.

DSMES aims

- The purpose of DSMES
  - To give people with diabetes the **knowledge, skills, and confidence** to **accept responsibility** for their self-management.
  - This includes **collaborating** with their health care team, **making informed decisions**, **solving problems**, **developing personal goals** and **action plans**, and **coping** with emotions and life stresses.

Patient-centered DSMES

ADCES Association of Diabetes Care & Education Specialists

ADCES7™

ADCES7 SELF-CARE BEHAVIORS™

PROBLEM SOLVING
REDUCING RISKS
MONITORING
TAKING MEDICATION
HEALTHY EATING
HEALTHY COPING
BEING ACTIVE

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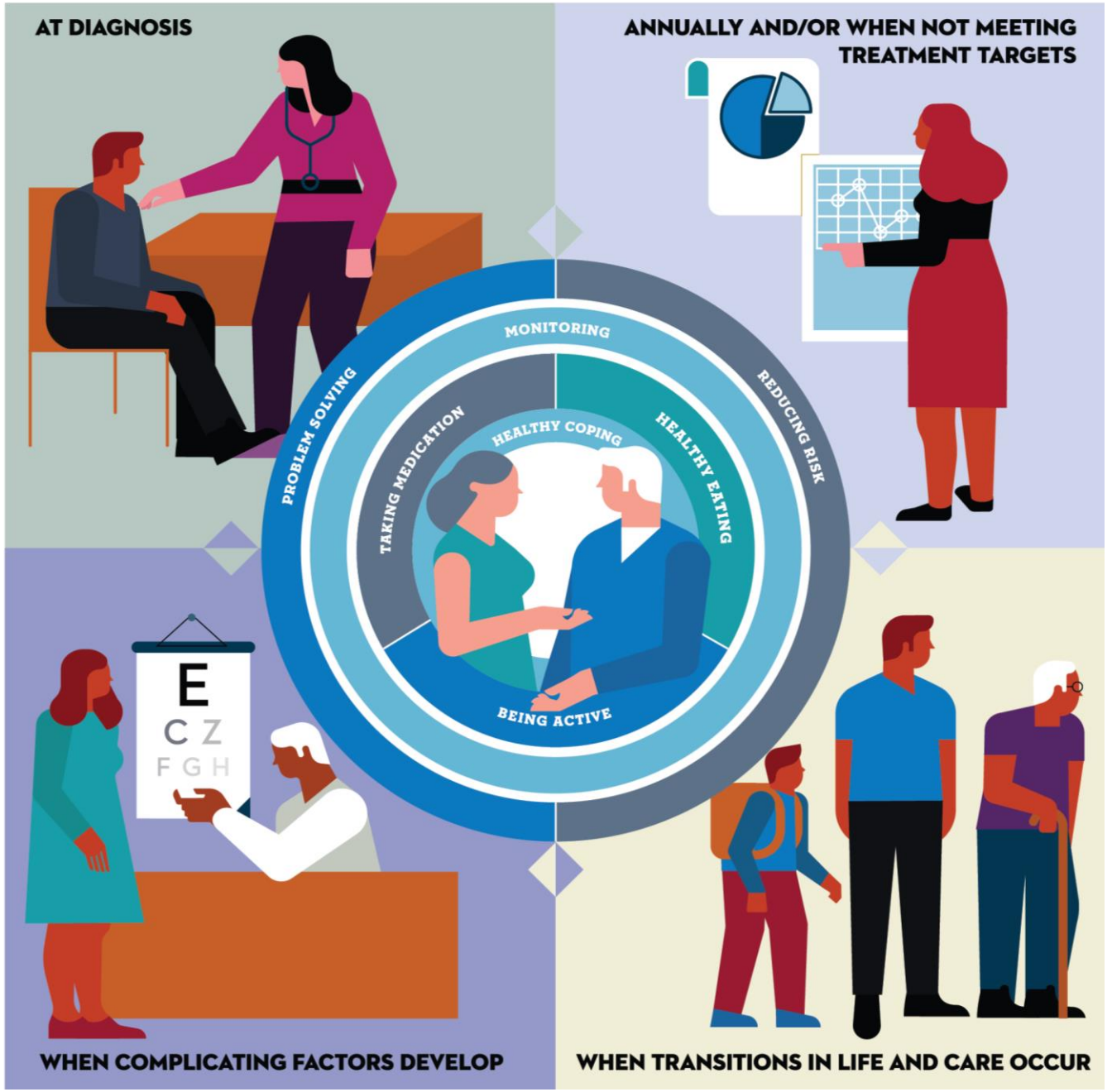
Critical Times to Provide DSMES



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DSMES Consensus Report Recommendations

DSMES Improves Health Outcomes, Quality of Life, and Is Cost Effective, and People With Diabetes Deserve the Right to DSMES Services. Therefore, It Is Recommended That:
Providers:
1. Discuss with all persons with diabetes the benefits and value of initial and ongoing DSMES.
2. Initiate referral to and facilitate participation in DSMES at the 4 critical times: (1) at diagnosis, (2) annually and/or when not meeting treatment targets, (3) when complicating factors develop, and (4) when transitions in life and care occur.
3. Ensure coordination of the medical nutrition therapy plan with the overall management strategy, including the DSMES plan, medications, and physical activity on an ongoing basis.
4. Identify and address barriers affecting participation with DSMES services following referral.
Health policy, payers, health systems, providers, and health care teams:
5. Expand awareness, access, and utilization of innovative and nontraditional DSMES services.
6. Identify and address barriers influencing providers' referrals to DSMES services.
7. Facilitate reimbursement processes and other means of financial support in consideration of cost savings related to the benefits of DSMES services.

Summary of DSMES Benefits to Discuss with People with Diabetes

- Provides critical education and support for implementing treatment plan
- Reduces hypoglycemia
- Addresses weight maintenance or loss
- Enhances self-efficacy and empowerment
- Increases healthy coping
- Decreases diabetes-related distress
- Promotes lifestyle behaviors including healthful meal planning and engagement in regular physical activity
- Improves quality of life
- Reduces all-cause mortality
- Reduces emergency department visits, hospital admission, and hospital readmission
- Lowers A1C

No negative side effects

Medicare / most insurers covers costs

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Diabetes Self-Management Education and Support

5.1 All people with diabetes should be advised to participate in developmentally and culturally appropriate diabetes self-management education and support (DSMES) to facilitate informed decision-making, self-care behaviors, problem-solving, and active collaboration with the health care team. **A**

5.2 Provide DSMES at diagnosis, annually and/or when not meeting treatment goals, when complicating factors develop (e.g., medical, functional, and psychosocial), and when transitions in life and care occur. **E**

5.3 Routinely assess clinical outcomes, health status, and well-being as key goals of DSMES. **C**

5.4 Screen for behavioral health concerns at the same critical times as evaluating the need for DSMES and refer to a qualified behavioral health professional if indicated to increase engagement in DSMES. **E**

Diabetes Care 2025;48(Supplement_1):S86–S127

Diabetes Self-Management Education and Support (continued)

5.5 DSMES should be culturally appropriate and responsive to individual preferences, needs, and values and may be offered in group or individual settings. **A** Such education and support should be documented and made available to members of the entire diabetes care team. **E**

5.6 Consider offering DSMES via telehealth and/or digital interventions as needed to meet individual preferences, address barriers to access, and improve satisfaction. **B**

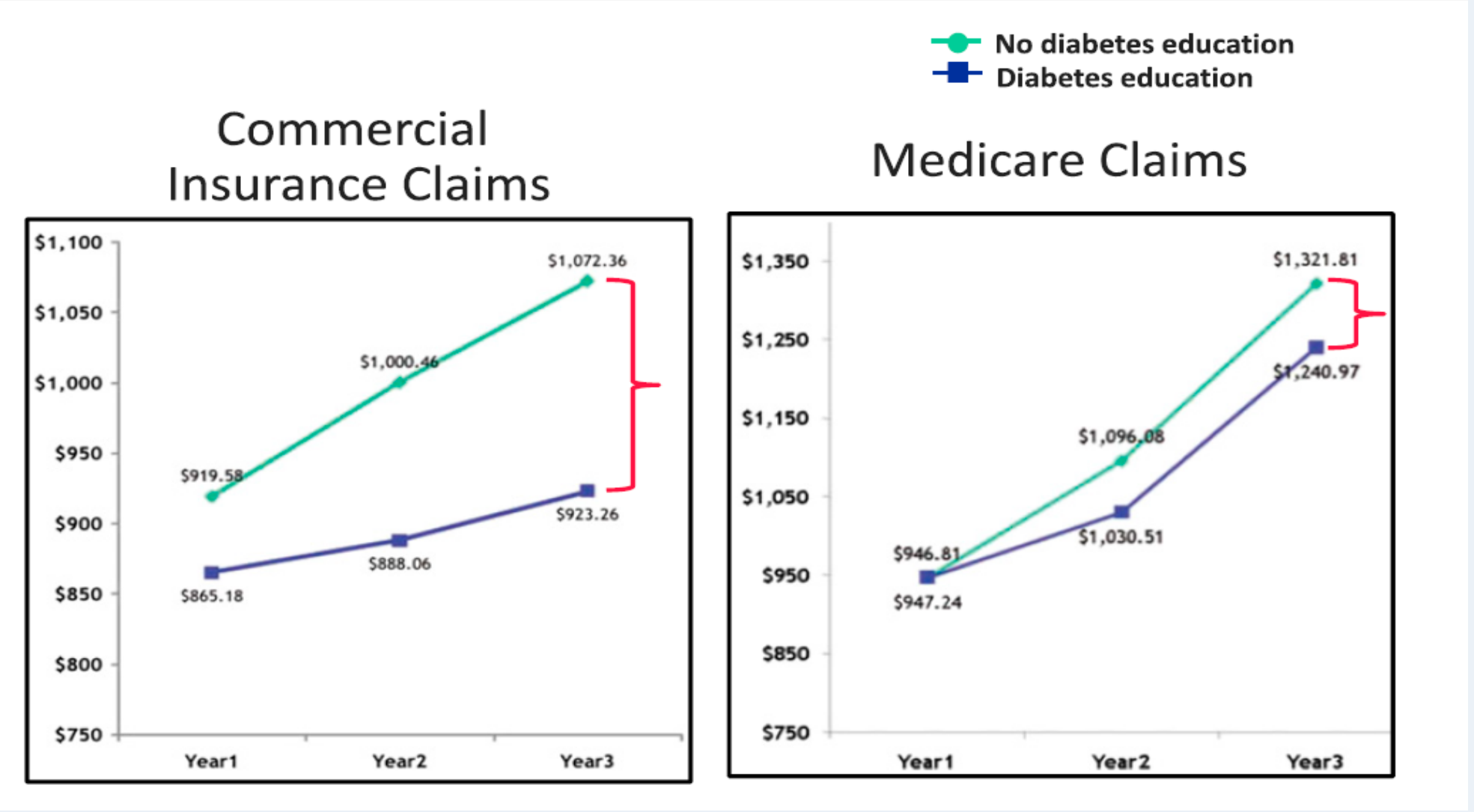
5.7 DSMES can improve outcomes and reduce costs, so reimbursement by third-party payors is recommended. **B**

5.8 Identify and address barriers to DSMES that exist at the payor, health system, clinic, health care professional, and individual levels. **E**

5.9 Screen for and include social determinants of health in guiding design and delivery of DSMES **C** with the ultimate goal of health equity across all populations.

Diabetes Care 2025;48(Supplement_1):S86–S127

Assessing the value of DSME



Duncan, I., C. Birkmeyer, S. Coughlin, Q. Li, D. Sherr and S. Boren (2009). "Assessing the value of diabetes education." The Diabetes Educator **35**(5): 752-760.

Duncan, I., C. Birkmeyer, S. Coughlin, Q. Li, D. Sherr and S. Boren (2009). "Assessing the value of diabetes education." The Diabetes Educator

SCIENTIFIC REVIEW

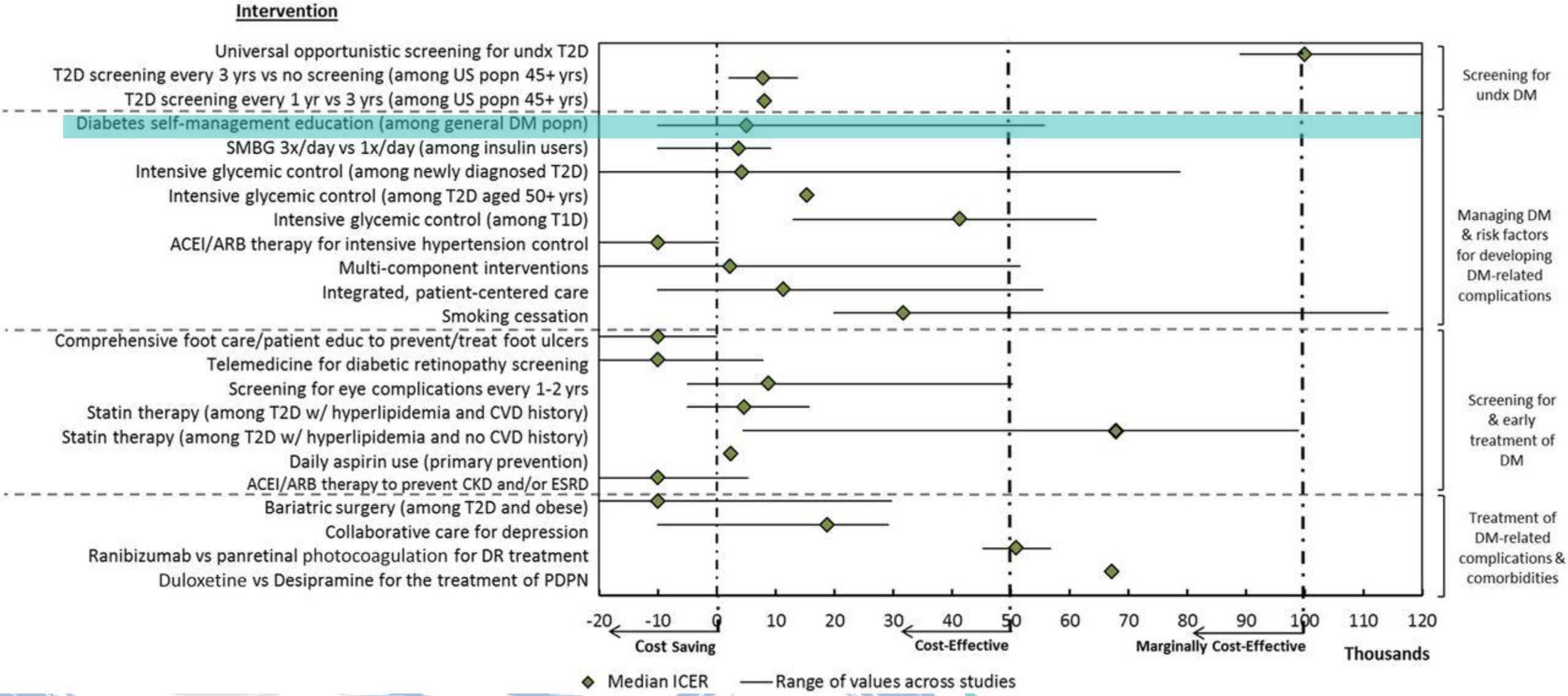
Cost-effectiveness of Interventions to Manage Diabetes: Has the Evidence Changed Since 2008?

Karen R. Siegel,[1] Mohammed K. Ali,[1,2] Xilin Zhou,[1] Boon Peng Ng,[1,3] Shawn Jawanda,[1] Krista Proia,[1] Xuanping Zhang,[1] Edward W. Gregg,[1] Ann L. Albright,[1] and Ping Zhang[1]

Diabetes Care 2020;43:1557–1592 | https://doi.org/10.2337/dci20-0017

OBJECTIVE

To synthesize updated evidence on the cost-effectiveness (CE) of interventions to manage diabetes, its complications, and comorbidities.



Diabetes Care 2020;43:1557–1592 | https://doi.org/10.2337/dci20-0017

DSMES in T1DM

	Study design	Short-term outcomes			Long-term outcomes
		Biomedical	Behavioural	Psychosocial	
Dose Adjustment for Normal Eating (DAFNE)[26] (UK)	Randomised controlled trial (n=169)	6 months: HbA_{1c} 1% reduction (p<0·0001); 12 months: HbA_{1b} 0·5% reduction (p=0·001); 6 months and 12 months: severe hypoglycaemia (change not significant); lipids and weight (change not significant)	Not available	12 months: improved quality of life, increased dietary freedom, improved general emotional wellbeing, and increased treatment satisfaction (all p<0·001)	4 years:[27] HbA_{1c} 0·36% reduction (p<0·01), improved quality of life (p<0·0001); 7 years:[28] HbA_{1c} 0·3% reduction (p=0·0048), no weight gain
Dose Adjustment for Normal Eating (OzDAFNE)[29] (Australia)	Pre-training and post-training evaluation* (n=506)	12 months: HbA_{1c} 0·4% reduction (p<0·001), severe hypoglycaemia reduction (p<0·001), weight 0·9 kg decrease (p=0·01), and reduction in hospital admission for diabetic ketoacidosis (non-significant trend)	Not available	12 months: reduction in severe diabetes-related distress (p<0·001)	Not available
Diabetes Treatment and Teaching Programme (DTTP)[30] (Germany)	Randomised controlled trial (n=300)	12 months: HbA_{1c} change not significant (at 24 months p<0·0001 [prespecified outcome]), severe hypoglycaemia (change not significant), reduction in diabetic ketoacidosis episodes (p<0·025), hospitalisation rates decreased by 40% (p<0·0001), and BMI increased to 22·6 kg/m^2 (SEM 0·2, p<0·05)	12 months: increased self-monitoring of blood glucose, increased carrying of emergency glucose supplies by patients	12 months: increased diabetes knowledge score	12 years:[31] improvement in HbA_{1c} and reduction in severe hypoglycaemia maintained
Programme for diabetes education and treatment for self-determined living with type 1 diabetes (PRIMAS)[32] (Germany)	Randomised controlled trial (n=160)	6 months: HbA_{1c} 0·4% reduction (p<0·005), severe hypoglycaemia (change not significant)	6 months: self-care behaviour (change not significant)	6 months: reduction in diabetes-related distress (p=0·032), increased diabetes self-efficacy (p=0·013)	Not available

For randomised controlled trials the control group was standard care. *Based on UK DAFNE programme, with efficacy already established in a randomised controlled trial.

Table 2: **Key outcomes of a selection of the most well-established self-management education programmes evaluated in the past 30 years meeting structured education criteria in type 1 diabetes, identified by the literature search**

Chatterjee S. The Lancet Diabetes & Endocrinology. 2018;6(2):130-42.

DSMES in T1DM

	Study design	Short-term outcomes			Long-term outcomes
		Biomedical	Behavioural	Psychosocial	
X-PERT[33] (UK)	Randomised controlled trial (n=314)	14 months: HbA_{1c} 0·6% reduction (p<0·001), weight, BMI, waist circumference, and total cholesterol reduction (p<0·001 for all)	14 months: increased fruit and vegetable intake per day (p=0·008), increased physical activity (p value not calculated), and increased foot care (p value not calculated)	14 months: increased food enjoyment (p=0·03), greater treatment satisfaction (p=0·02), increased diabetes knowledge (p<0·001), and greater self-empowerment (p=0·04)	Not available
DESMOND[34] (UK)	Randomised controlled trial (n=824)	12 months: HbA_{1c} 1·49% reduction (p=0·05), weight 2·98 kg decrease (p=0·027)	12 months: increased odds of not smoking (p=0·033)	12 months: positive change in illness beliefs (p<0·001), reduced depression score (p=0·032)	3 years: sustained improvements in illness beliefs[35]
Structured Intensive Diabetes Education Programme (SIDEP)[36] (South Korea)	Randomised controlled trial (n=547)	6 months: HbA_{1c} 1·5% reduction (p<0·05)	6 months: increased physical activity (p=0·004), improved diet (p<0·001), increased self-monitoring of blood glucose (p<0·001)	Not available	4 years:[36] HbA_{1c} reduction (p<0·005), better self-care (p<0·05), reduced annual diabetes hospitalisation rates (p<0·05), and sustained improvement in physical activity (p=0·004), but no sustained improvement in diet or self-monitoring of blood glucose
Diabetes Manual[37] (UK)	Cluster randomised controlled trial vs 6 month delayed intervention control group (n=245)	6 months: no significant change in HbA_{1c}, blood pressure, cholesterol, or BMI	Not available	6 months: reduction in diabetes-related distress scores (difference −4·5, 95% CI −8·1 to −1·0, p=0·012)	Not available
ROMEO[38] (Italy)	Randomised controlled trial comparing control group with individual care (n=815)	4 years: improvement in HbA_{1c}, low-density lipoprotein cholesterol, triglycerides, blood pressure, BMI, serum creatinine, and high-density lipoprotein cholesterol (all p<0·0001)	Not available	4 years: improvement in health behaviours, quality of life, and diabetes knowledge (both p<0·001)	Not available
Uppsala study[39] (Sweden)	Randomised controlled trial vs control group (n=101)	12 months: no significant change in HbA_{1c} or BMI	12 months: no significant change in self-efficacy	12 months: improvement in confidence in diabetes knowledge (p<0·05)	Not available

For randomised controlled trials the control group was standard care.

Table 3: **Key outcomes of a selection of the most well-established self-management education programmes evaluated in the past 10 years in type 2 diabetes meeting structured education criteria, identified by the literature search**

Chatterjee S. The Lancet Diabetes & Endocrinology. 2018;6(2):130-42.

	Population	Number of studies	Main findings	Limitations
Pillay et al (2015)[14]	Type 1 diabetes in adolescents (aged 9·7–15·4 years) and adults (30–49 years)	36 prospective randomised controlled trials comparing effects of diabetes self-management education on behavioural, clinical, and health outcomes compared with usual care or active controls	Greater HbA_{1c} reduction at 6 months with diabetes self-management education, but not statistically significant at 12 months; low or insufficient strength of evidence for difference between usual care, active controls, and self-management education in blood glucose self-monitoring, health-related quality of life, body composition, dietary intake, physical activity, or diabetes-specific quality of life	Medium or high risk of bias in all studies; limited evidence for many outcomes
Pillay et al (2015)[15]	Type 2 diabetes in adults (45–75 years)	132 randomised controlled trials comparing the effect of behavioural programmes with usual care, active controls, or other behavioural programmes on glycaemic control	Most lifestyle and diabetes self-management programmes led to ≥0·4% HbA_{1c} reduction (clinically significant) but little benefit if contact time ≤10 h; larger effect sizes were seen with face-to-face programmes than with programmes delivered by technology (eg, telephone counselling, text messaging, applications, and online modules); greater HbA_{1c} reduction in adults <65 years of age, in those with baseline HbA_{1c} ≥7%, or in those from minority ethnic groups	Medium or high risk of bias in all studies; most outcomes reported very soon after interventions
Chrvala et al (2016)[16]	Type 2 diabetes in adults (47·9–75·0 years)	118 unique interventions investigated in randomised controlled trials that assessed the effect of diabetes self-management and support methods, providers, duration, and contact time on glycaemic control	Mean HbA_{1c} reduction was 0·74% with intervention *vs* 0·17% for control groups; combination (group and individual engagement) diabetes self-management education was associated with the greatest HbA_{1c} change compared with group, individual, and remote interventions; self-management education duration ≥10 h was associated with greater reduction in mean HbA_{1c}	Significant intervention heterogeneity
Steinsbekk et al (2012)[17]	Type 2 diabetes in adults (mean age 60 [SD 9·5] years)	21 randomised controlled trials evaluating the effect of group-based diabetes self-management education *vs* routine treatment on glycaemic, lifestyle, and psychosocial outcomes	Significant HbA_{1c} reductions at 6 months (−0·44%, p<0·0006), 12 months (−0·46%, p=0·001), and 2 years (−0·87%, p<0·00001); significant improvements in diabetes knowledge (at 6, 12, and 24 months), self-management skills (at 6 months), and empowerment and self-efficacy (at 6 months); no significant improvements in patient satisfaction or bodyweight at 12 months or quality of life	High heterogeneity among trials
He et al (2017)[18]	Type 2 diabetes in adults (42–68 years)	42 randomised controlled trials evaluating effect of diabetes self-management education compared with usual care with at least 12 months of follow-up (range 12 months to 5 years) on all-cause mortality	Mortality in 159 participants (2·3%) in diabetes self-management education group *vs* 187 (3·1%) in usual care group; self-management education significantly reduced the risk of all-cause mortality (pooled relative risk 0·74, 95% CI 0·60–0·90, p=0·003)	Absence of clear definitions for usual care; differences in methods of diabetes self-management education interventions

Table 1: **Main systematic reviews of diabetes self-management education programmes done between 2012 and 2017, identified during the literature search** Chatterjee S. The Lancet Diabetes & Endocrinology. 2018;6(2):130-42.

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DSME and All cause Mortality

Endocrine
DOI 10.1007/s12020-016-1168-2

META-ANALYSIS

Diabetes self-management education reduces risk of all-cause mortality in type 2 diabetes patients: a systematic review and meta-analysis

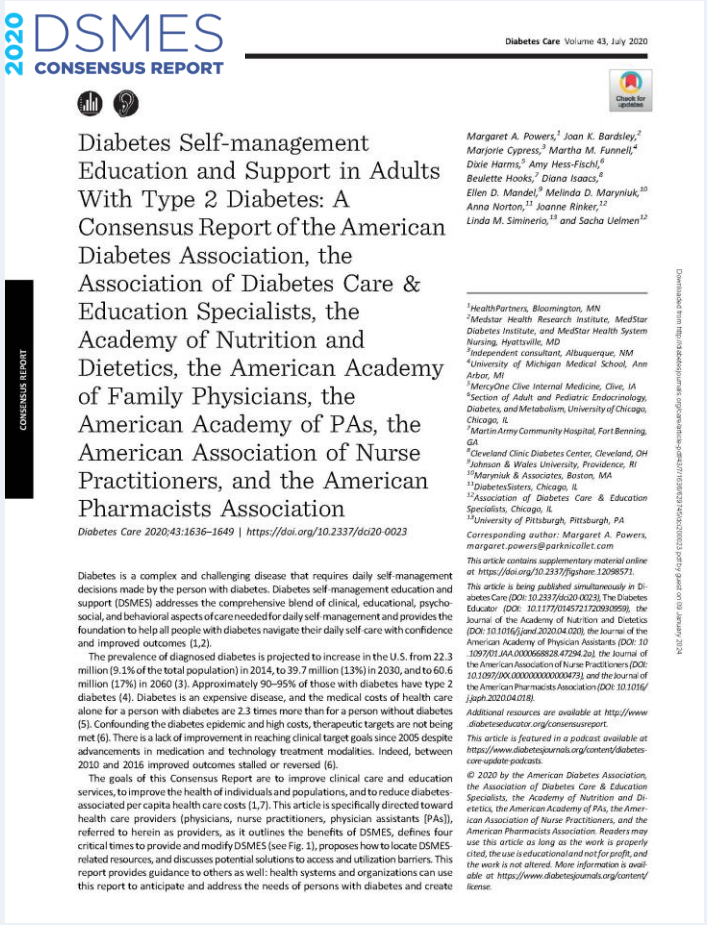
Xiaoqin He[1,2] · Jie Li[3] · Bin Wang[1] · Qiuming Yao[1] · Ling Li[1] · Ronghua Song[1] · Xiaohong Shi[1] · Jin-an Zhang[1]

Received: 15 August 2016 / Accepted: 1 November 2016

26% Reduction in All Cause Mortality

He X, Li J, et al, Endocrine ; 2017.

Key clinical Benefits of DSMES



2020 DSMES CONSENSUS REPORT

Diabetes Care Volume 43, July 2020

Diabetes Self-management Education and Support in Adults With Type 2 Diabetes: A Consensus Report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy of Family Physicians, the American Academy of PAs, the American Association of Nurse Practitioners, and the American Pharmacists Association

CONSENSUS REPORT

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Margaret A. Powers,[1] Joan K. Bardsley,[2] Marjorie Cypress,[3] Martha M. Funnell,[4] Dixie Harms,[5] Amy Hess-Fischl,[6] Beulette Hooks,[7] Diana Isaacs,[8] Ellen D. Mandel,[9] Melinda D. Maryniuk,[10] Anna Norton,[11] Joanne Rinker,[12] Linda M. Siminerio,[13] and Sacha Uelmen[12]

[1]HealthPartners, Bloomington, MN
[2]Medstar Health Research Institute, MedStar Diabetes Institute, and MedStar Health System Nursing, Hyattsville, MD
[3]Independent consultant, Albuquerque, NM
[4]University of Michigan Medical School, Ann Arbor, MI
[5]MercyOne Clive Internal Medicine, Clive, IA
[6]Section of Adult and Pediatric Endocrinology, Diabetes, and Metabolism, University of Chicago, Chicago, IL
[7]Martin Army Community Hospital, Fort Benning, GA
[8]Cleveland Clinic Diabetes Center, Cleveland, OH
[9]Johnson & Wales University, Providence, RI
[10]Maryniuk & Associates, Boston, MA
[11]DiabetesSisters, Chicago, IL
[12]Association of Diabetes Care & Education Specialists, Chicago, IL
[13]University of Pittsburgh, Pittsburgh, PA

Corresponding author: Margaret A. Powers, margaret.powers@parknicollet.com

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Additional resources are available at http://www.diabeteseducator.org/consensusreport.

This article is featured in a podcast available at https://www.diabetesjournals.org/content/diabetes-care-update-podcasts.

Diabetes is a complex and challenging disease that requires daily self-management decisions made by the person with diabetes. Diabetes self-management education and support (DSMES) addresses the comprehensive blend of clinical, educational, psychosocial, and behavioral aspects of care needed for daily self-management and provides the foundation to help all people with diabetes navigate their daily self-care with confidence and improved outcomes (1,2).

The prevalence of diagnosed diabetes is projected to increase in the U.S. from 22.3 million (9.1% of the total population) in 2014, to 39.7 million (13%) in 2030, and to 60.6 million (17%) in 2060 (3). Approximately 90–95% of those with diabetes have type 2 diabetes (4). Diabetes is an expensive disease, and the medical costs of health care alone for a person with diabetes are 2.3 times more than for a person without diabetes (5). Confounding the diabetes epidemic and high costs, therapeutic targets are not being met (6). There is a lack of improvement in reaching clinical target goals since 2005 despite advancements in medication and technology treatment modalities. Indeed, between 2010 and 2016 improved outcomes stalled or reversed (6).

The goals of this Consensus Report are to improve clinical care and education services, to improve the health of individuals and populations, and to reduce diabetes-associated per capita health care costs (1,7). This article is specifically directed toward health care providers (physicians, nurse practitioners, physician assistants [PAs]), referred to herein as providers, as it outlines the benefits of DSMES, defines four critical times to provide and modify DSMES (see Fig. 1), proposes how to locate DSMES-related resources, and discusses potential solutions to access and utilization barriers. This report provides guidance to others as well: health systems and organizations can use this report to anticipate and address the needs of persons with diabetes and create

- Average A1C reduction of 0.45–0.57% when compared with usual care for people with T2D treated with a variety of modalities (lifestyle alone, oral and injected medication)
- Reduction in the onset and/or worsening of diabetes-related complications
- Reduction of all-cause mortality

American Diabetes Association. · ADCES Association of Diabetes Care & Education Specialists · eat right. Academy of Nutrition and Dietetics

APhA · AANP American Association of NURSE PRACTITIONERS · AAPA · AAFP AMERICAN ACADEMY OF FAMILY PHYSICIANS

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DSME & Glycemic control

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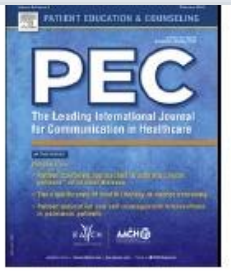


Review article

Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control

Carole A. Chrvala[a], Dawn Sherr[b,*], Ruth D. Lipman[b]

[a] Health Matters, Inc., Chapel Hill, NC, USA
[b] American Association of Diabetes Educators, 200 W. Madison Street, Chicago, IL 60606, USA

(Chrvala, Sherr et al. 2016)

DSME & Glycemic control

- 118 unique interventions
- 61.9% reporting significant changes in A1C
- Overall mean reduction in A1C was 0.74 and 0.17 for intervention and control groups
- An average absolute reduction in A1C of 0.57

(Chrvala, Sherr et al. 2016)

Mode of DSME Delivery

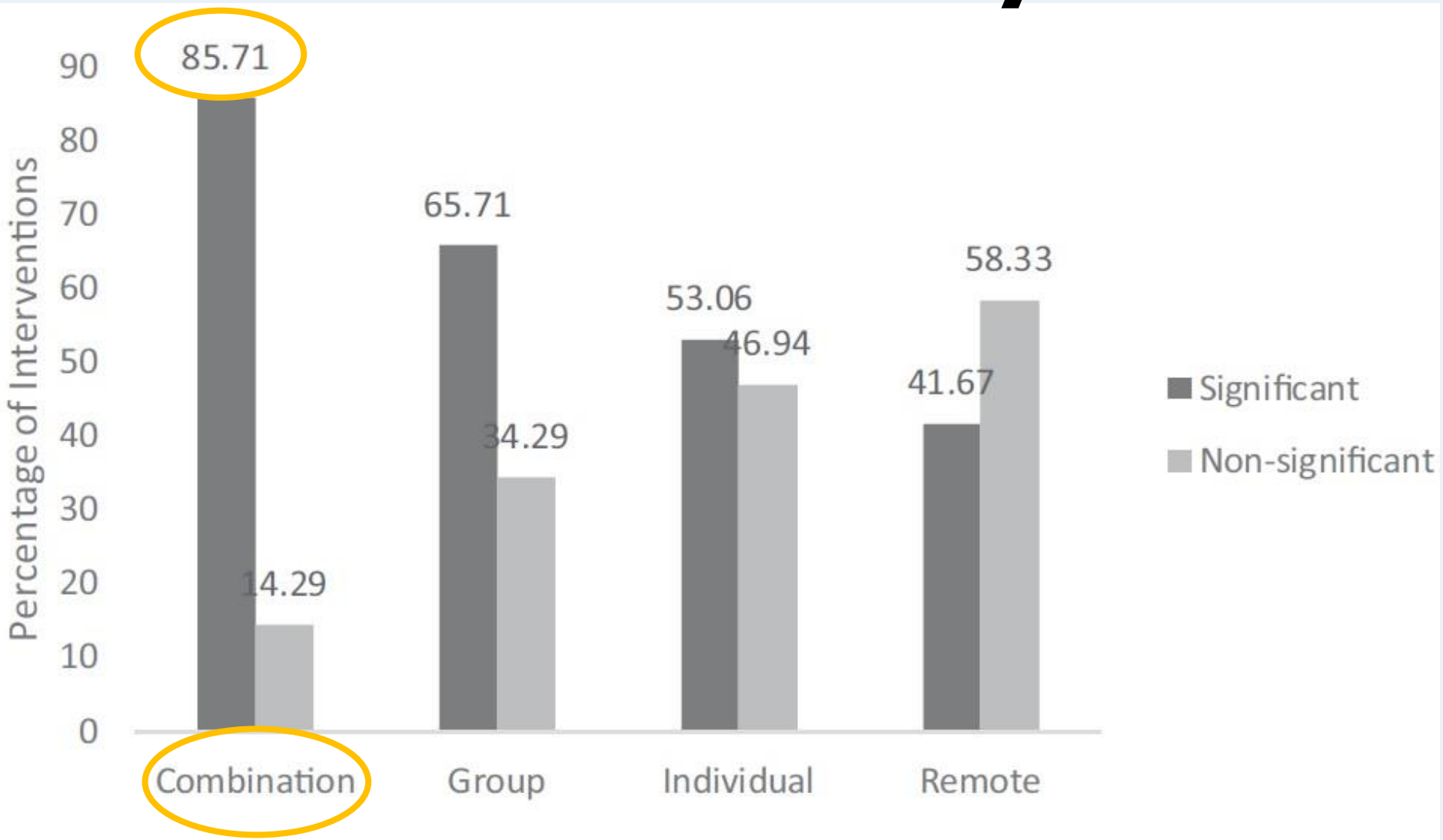


Fig. 2. Mode of delivery.

(Chrvala, Sherr et al. 2016)

Effect of Baseline HbA1c

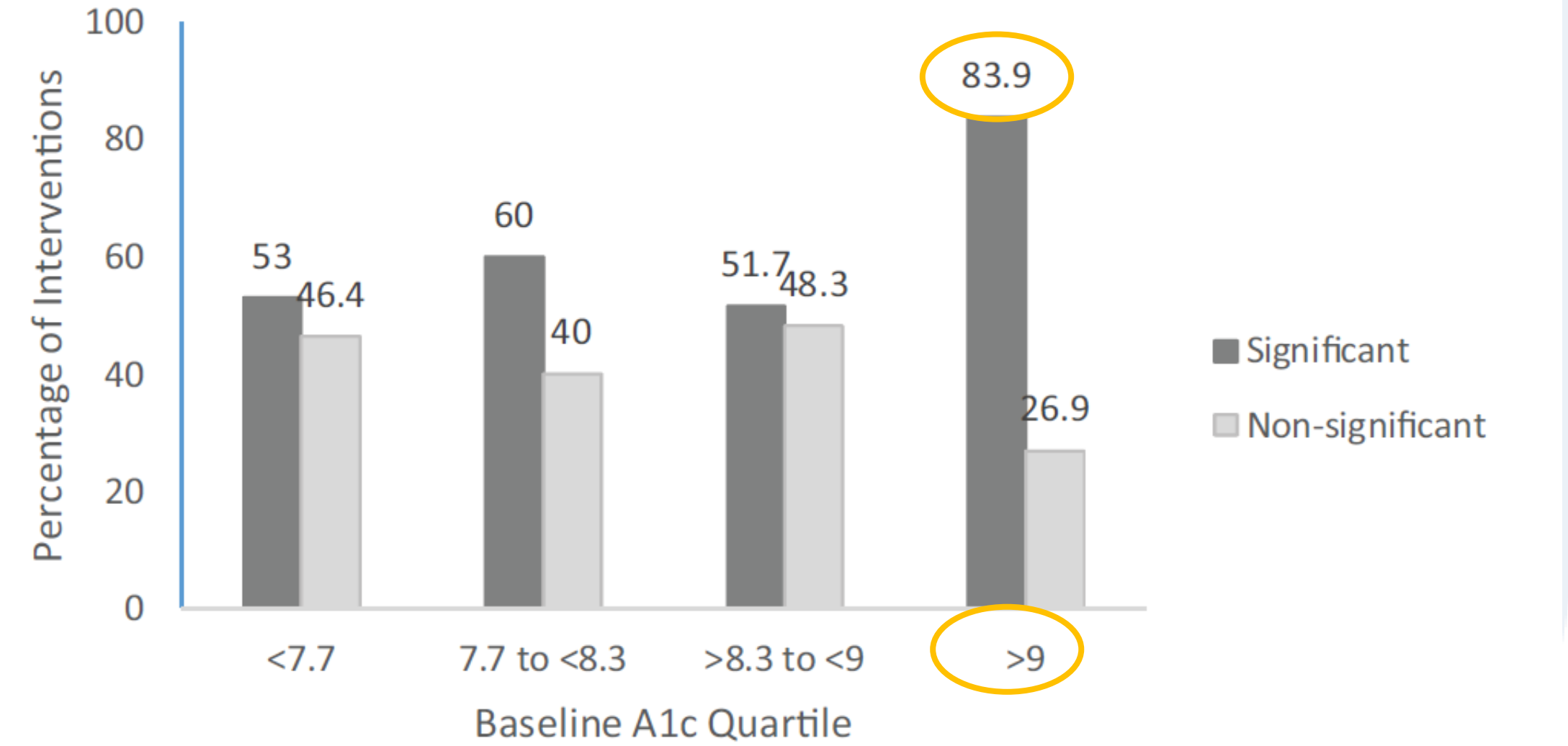


Fig. 4. Baseline A1c.

(Chrvala, Sherr et al. 2016)

DSME Contact Time

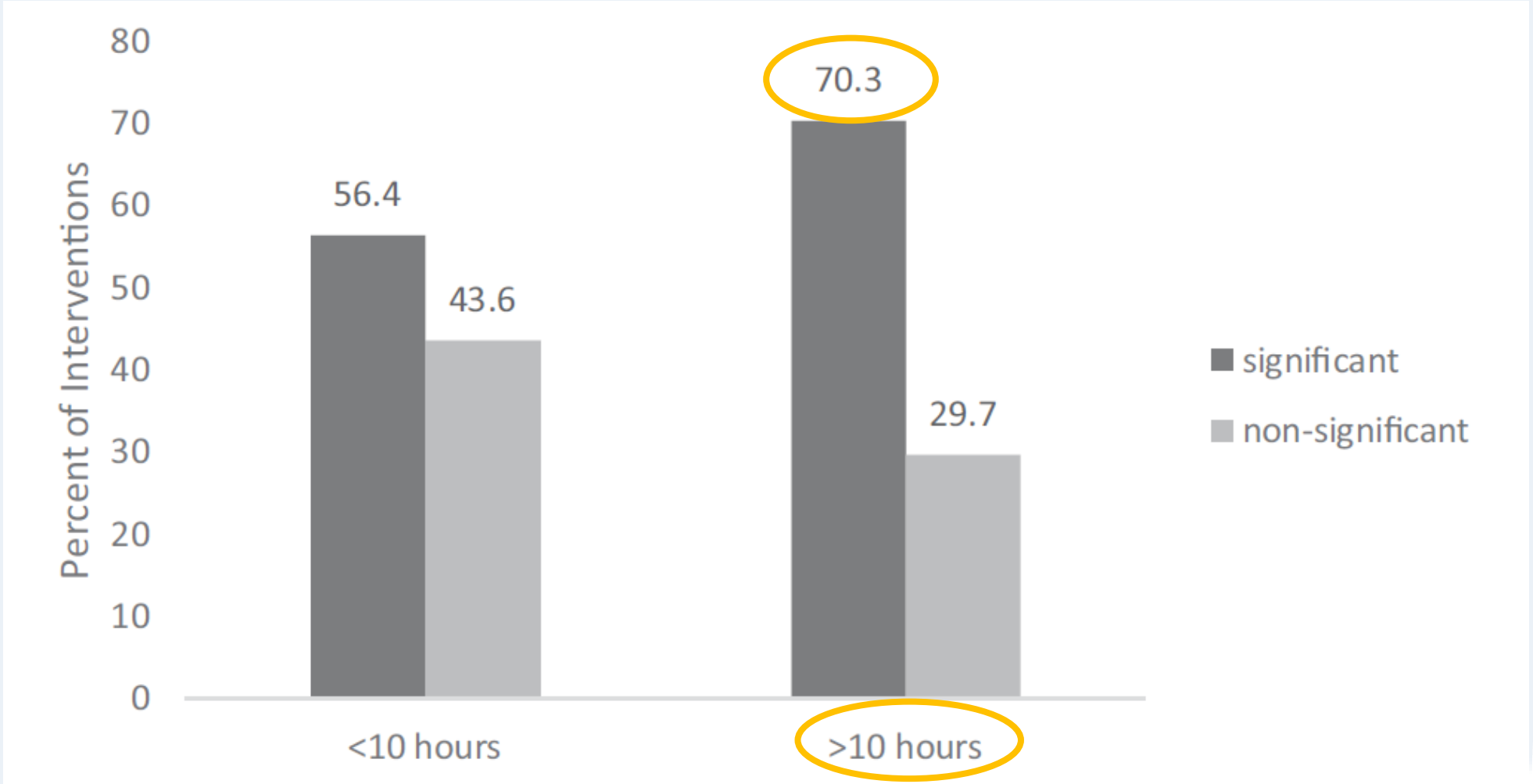


Fig. 6. Maximum DSME contact time.

(Chrvala, Sherr et al. 2016)

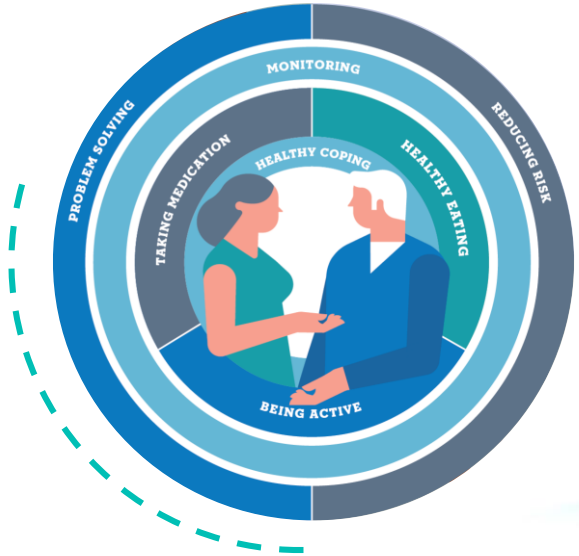
If DSMES were a pill, would you prescribe it?

Comparing the benefits of DSMES/MNT vs metformin therapy

	Benefits rating	
CRITERIA	DSMES/MNT	METFORMIN
Efficacy	High	High
Hypoglycemia risk	Low	Low
Weight	Neutral/Loss	Neutral/Loss
Side effects	None	Gastrointestinal
Cost	Low/Savings	Low
Psychosocial benefits*	High	N/A

N/A, not applicable. *Psychosocial benefits include *improvements to* quality of life, self-efficay, empowerment, healthy coping, knowledge, self-care behaviors, meal planning, healthier food choices, more activity, use of glucose monitoring, lower blood pressure and lipids and *reductions in* problems in managing diabetes, diabetes distress, and the risk of long-term complications (and prevention of acute complications).

Low Utilization of DSME despite its proven benefits is a Global Challenge!



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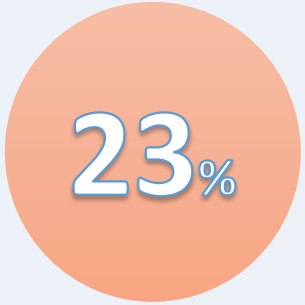
Low Utilization of DSMES

Of **MEDICARE** beneficiaries with newly diagnosed diabetes used DSMT services[1]

Of individuals with newly diagnosed T2D with **PRIVATE HEALTH** insurance received DSMES within 12 months of diagnosis[2]

UK:
of patients with T2DM attended DSME.



Iran:

Phase 2 analysis from nationwide diabetes report of National Program for Prevention and Control of Diabetes (NPPCD-2018)

The prevalence of patients who received education for nutrition therapy or diabetes self-management was 16.3% and 23.3% respectively.

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DIABETICMedicine

DOI: 10.1111/dme.13120

Systematic Review or Meta-analysis

Reasons why patients referred to diabetes education programmes choose not to attend: a systematic review

G. Horigan[1], M. Davies[2], F. Findlay-White[3], D. Chaney[3] and V. Coates[1]

[1]Institute of Nursing and Health Research, University of Ulster, Magee Campus, Londonderry, [2]Department of Clinical Psychology, Belfast Health and Care Trust, Belfast and [3]Diabetes UK Northern Ireland, Belfast, UK

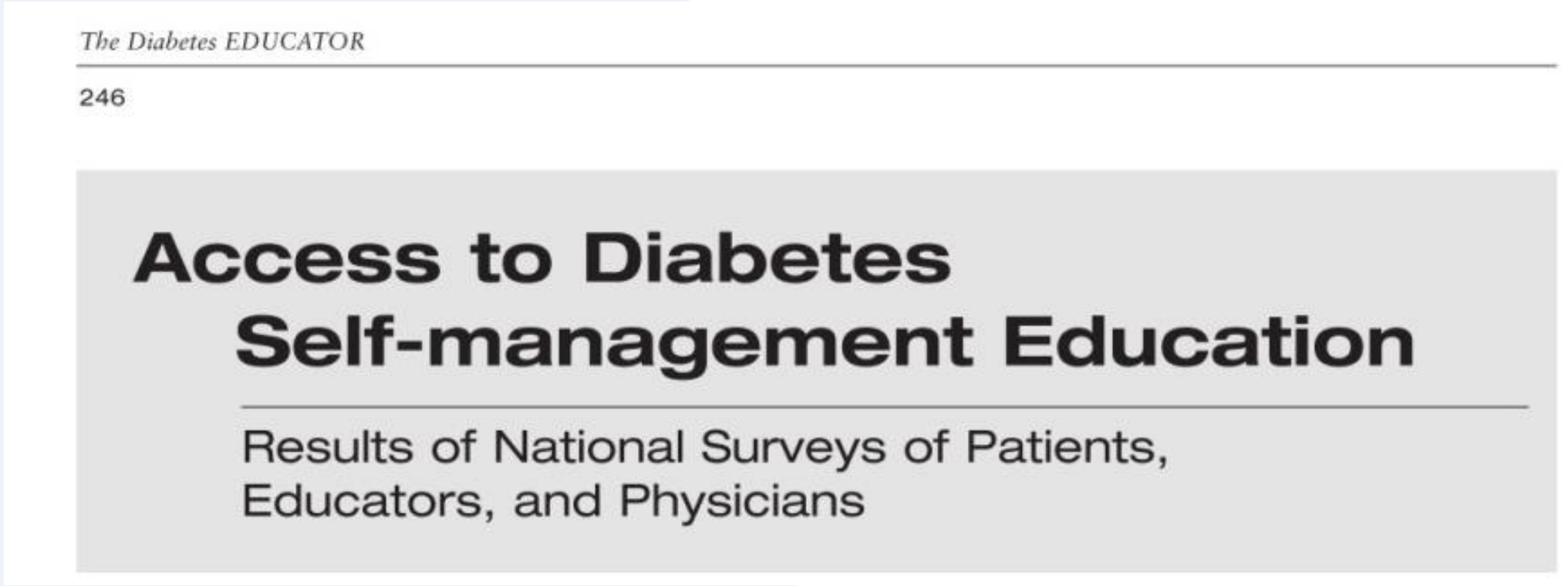
Accepted 14 March 2016

Reasons

Those who could not go	Logistical reasons	Lack of transport
		Venue too far away
		No parking at venue
		Length of programmes
		Timings of programmes unsuitable
		More pressing commitments e.g. family and/or work
	Medical reasons	Other disabilities or illnesses preventing the person from attending structured diabetes education.
		Inability to come alone
	Financial reasons	Not having any or insufficient health insurance cover
		Inability to afford travel and/or costs associated with getting to venue.
Those who would not go	No perceived benefit	Feeling no perceived benefits to be gained
		Not seeing it as high priority.
		Physicians influences.
		Already satisfied with care received
	Knowledge	Enough knowledge already
		Feeling they already receive adequate information from physician/GP
		Feeling there is no need to be educated as they do not perceive a problem.
		Lack of information on programmes
		Being unaware of available programmes
		Programmes not promoted by healthcare professionals.
	Emotional	Negative feelings with regard to diabetes education
		Negative feelings with regard to groups
		Not wanting to know side effects of diabetes.
		Fear of excessive demands.
		Denial
		Not wanting anyone to know.
	Cultural	Literacy/language/cultural problems
		Those with no reason/lack of interest and/or not knowing why they would not go.

Horigan G, et al. Diabetic Medicine. 2017

Access to Diabetes Self-management Education



Access to Diabetes Self-management Education

Results of National Surveys of Patients, Educators, and Physicians

Peyrot,et al, Diabetes Educ, (2009).

Barriers to DSME Use

Perceived Barriers to DSME Use[a]

Educator Reports of Barrier Importance	Mean Score
MD do not tell patient DSME is important	74
MD do not recognize program quality	55
MD do not want to lose control of patient	54
MD do not know referral procedure	52
MD do not believe DSME works	49
MD do not know where to get DSME	44
Lack of financial support	60
Lack of clerical support	53
Lack of administrative support	52

Peyrot,et al, Diabetes Educ, (2009).

Barriers to DSME Use

Physician Self-reported Beliefs	PCP	Specialist
Patients are told to do things I do not want[b]	44	49
My patients are not interested in DSME	41	39
Do not have enough DSME referral sources[c]	45	32
Referral procedure is not easy[c]	37	28
DSME programs do not have quality I want[c]	31	24
I lose patients who attend DSME[c]	29	20
I do not get patients to see DSME importance[c]	24	17
Do not know procedure for referral[d]	21	14
Do not believe DSME works	18	14

Peyrot,et al, Diabetes Educ, (2009).

Physicians as Key to Encouraging DSMES Use

- Educators see physicians as key to encouraging DSME use in patients
- Physician recommendations are central factors in patient decisions about health care.
- Some physicians (15%) are concerned about losing patients sent to DSME, and 11% of patients report changing physicians as a result of DSME.

Peyrot,et al, Diabetes Educ, (2009).

DSMES Provider Characteristics:

- Current research supports **nurses, dietitians, and pharmacists** as providers of DSMES who may also develop curriculum
- Members of the DSMES team should have **specialized clinical knowledge in diabetes** and **behavior change principles.**
- Certification as a **certified diabetes educator (CDE)** or **board certified-advanced diabetes management (BC-ADM)**

American Diabetes Association (2019). "Standards of medical care in diabetes ".

Gabric Diabetes School: What we have learned

Report

EMHJ – Vol. 24 No. 1 – 2018

GABRIC Diabetes School: an innovative education centre for people with diabetes

Alireza Esteghamati [1], Farhad Hosseinpanah [2], Seyed Adel Jahed [3], Hadi Harati [3], Mohammad Taghi Cheraghchi Bashi Astaneh [3], Hormoz Kaykhanzadeh [3] and Sara Sedaghat [3]

[1]Endocrinology and Meatbolism Research Center, Vali-Asr Hospital School of Medicine, Tehran University of Medical Sciences, Tehran, Islamic Republic of Iran [2]Obesity research center, Research institute for Endocrine Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Islamic Republic of Iran [3]Gabric Diabetes Education Association, Tehran, Islamic Republic of Iran (Correspondence to: Sara Sedaghat: s.sedaghat@gabric.ir).

Abstract

Diabetes prevalence and deaths attributable to diabetes continue to rise across globally. Diabetes Self-Management Education and Support (DSME/S) is a critical resource designed to help people with diabetes (PWD) successfully self-manage their disease; however, its utilization is too low. In the Islamic Republic of Iran, there are currently limited structured educational programmes and no national standards for DSME/S protocol. In response to this, the GABRIC Diabetes Education Association (GDEA) has been developed as a school for diabetics, which has a comprehensive DSME/S programme for PWD with 18 distinct courses on 5 levels for 8 target groups. In addition, GABRIC has developed a database registry with more than 100 000 members throughout the country, of whom 95% are diabetic with a proportion of 82% Type 2 diabetes and 13% Type 1 diabetes. The success of the GABRIC school model results is yet to be investigated through study trials, and offers a fruitful line of research.

Keywords: Diabetes, diabetic, education, self-management, noncommunicable diseases

Citation: Esteghamati A, Hosseinpanah F, Adel Jahed S, Harati H, Astaneh MTCB, Kaykhanzadeh H, et al. GABRIC diabetes school: an innovative education centre for diabetics. East Mediterr Health J. 2018;24(1):99–103. https://doi.org/10.26719/2018.24.1.99

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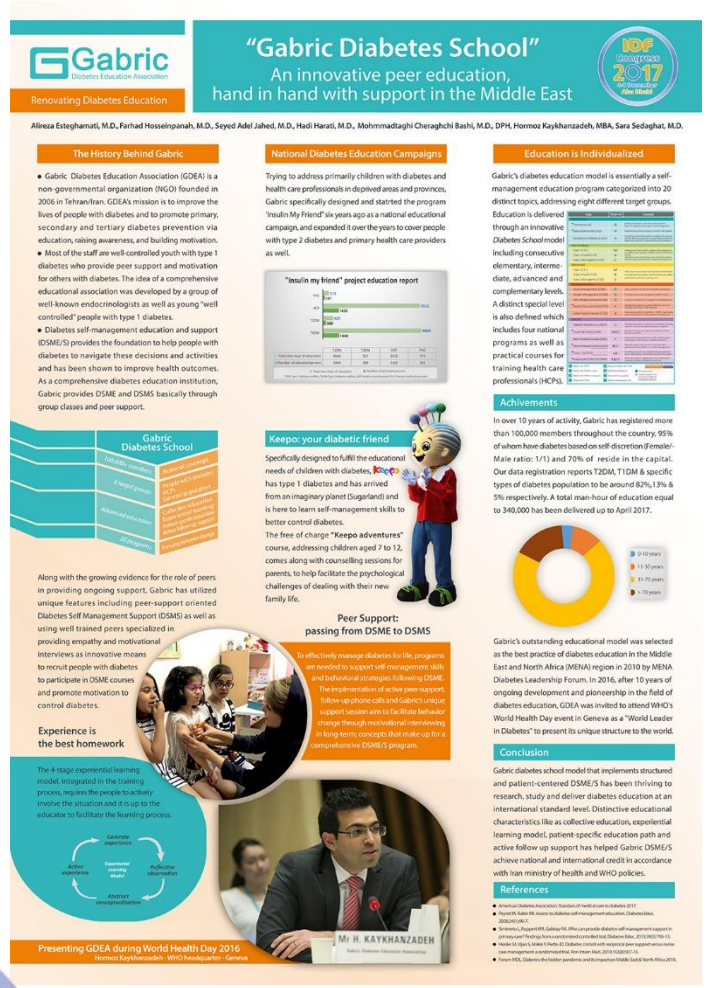
Diabetes Academy GABRIC

International Diabetes Federation Member



Gabric
Diabetes Education Association
Renovating Diabetes Education

"Gabric Diabetes School"

An innovative peer education, hand in hand with support in the Middle East

IDF Congress 2017 4-8 December Abu Dhabi

Alireza Esteghamati, M.D., Farhad Hosseinpanah, M.D., Seyed Adel Jahed, M.D., Hadi Harati, M.D., Mohmmadtaghi Cheraghchi Bashi, M.D., DPH, Hormoz Kaykhanzadeh, MBA, Sara Sedaghat, M.D.

The History Behind Gabric

- Gabric Diabetes Education Association (GDEA) is a non-governmental organization (NGO) founded in 2006 in Tehran/Iran. GDEA's mission is to improve the lives of people with diabetes and to promote primary, secondary and tertiary diabetes prevention via education, raising awareness, and building motivation.
- Most of the staff are well-controlled youth with type 1 diabetes who provide peer support and motivation for others with diabetes. The idea of a comprehensive educational association was developed by a group of well-known endocrinologists as well as young "well controlled" people with type 1 diabetes.
- Diabetes self-management education and support (DSME/S) provides the foundation to help people with diabetes to navigate these decisions and activities and has been shown to improve health outcomes. As a comprehensive diabetes education institution, Gabric provides DSME and DSMS basically through group classes and peer support.

National Diabetes Education Campaigns

Trying to address primarily children with diabetes and health care professionals in deprived areas and provinces, Gabric specifically designed and started the program 'Insulin My Friend" six years ago as a national educational campaign, and expanded it over the years to cover people with type 2 diabetes and primary health care providers as well.

Education is Individualized

Gabric's diabetes education model is essentially a self-management education program categorized into 20 distinct topics, addressing eight different target groups. Education is delivered through an innovative *Diabetes School* model including consecutive elementary, intermediate, advanced and complementary levels. A distinct special level is also defined which includes four national programs as well as practical courses for training health care professionals (HCPs).

Keepo: your diabetic friend

Specifically designed to fulfill the educational needs of children with diabetes, Keepo has type 1 diabetes and has arrived from an imaginary planet (Sugarland) and is here to learn self-management skills to better control diabetes.
The free of charge **"Keepo adventures"** course, addressing children aged 7 to 12, comes along with counselling sessions for parents, to help facilitate the psychological challenges of dealing with their new family life.

Achivements

In over 10 years of activity, Gabric has registered more than 100,000 members throughout the country, 95% of whom have diabetes based on self-discretion (Female/-Male ratio: 1/1) and 70% of reside in the capital. Our data registration reports T2DM, T1DM & specific types of diabetes population to be around 82%, 13% & 5% respectively. A total man-hour of education equal to 340,000 has been delivered up to April 2017.

Gabric's outstanding educational model was selected as the best practice of diabetes education in the Middle East and North Africa (MENA) region in 2010 by MENA Diabetes Leadership Forum. In 2016, after 10 years of ongoing development and pioneership in the field of diabetes education, GDEA was invited to attend WHO's World Health Day event in Geneva as a "World Leader in Diabetes" to present its unique structure to the world.

Along with the growing evidence for the role of peers in providing ongoing support, Gabric has utilized unique features including peer-support oriented Diabetes Self Management Support (DSMS) as well as using well trained peers specialized in providing empathy and motivational interviews as innovative means to recruit people with diabetes to participate in DSME courses and promote motivation to control diabetes.

Experience is the best homework

Peer Support: passing from DSME to DSMS

To effectively manage diabetes for life, programs are needed to support self-management skills and behavioral strategies following DSME. The implementation of active peer-support, follow-up phone calls and Gabric's unique support session aims to facilitate behavior change through motivational interviewing in long-term concepts that make up for a comprehensive DSME/S program.

The 4-stage experiential learning model, integrated in the training process, requires the people to actively involve the situation and it is up to the educator to facilitate the learning process.

Conclusion

Gabric diabetes school model that implements structured and patient-centered DSME/S has been thriving to research, study and deliver diabetes education at an international standard level. Distinctive educational characteristics like as collective education, experiential learning model, patient-specific education path and active follow up support has helped Gabric DSME/S achieve national and international credit in accordance with Iran ministry of health and WHO policies.

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Presenting GDEA during World Health Day 2016
Hormoz Kaykhanzadeh - WHO headquarter - Geneva

Gabric
Diabetes Education Association
Renovating Diabetes Education

"Telehealth facilitates national access to DSMES"

peer support integrated tele-education for people with T1DM (PSITE-1) project

IDF Congress 2019 2-6 December Busan Korea

Alireza Esteghamati, M.D.,Farhad Hosseinpanah, M.D., Seyed Adel Jahed, M.D., Hadi Harati, M.D., M.Taghi Cheraghchi Bashi, M.D., DPH
Hormoz Kaykhanzadeh, MBA, Sara Sedaghat, M.D., Sima Abbasi M.S., Maryam Azizian M.S.

Background

Diabetes is a chronic disease that requires the affected person to make a multitude of daily self-management decisions and perform complex care activities.
Diabetes self-management education (DSME) is the process of facilitating the knowledge, skill, and ability necessary for diabetes self-care. Diabetes self-management support (DSMS) refers to the support that is required for implementing and sustaining coping skills and behaviors needed to self manage on an ongoing basis.(1)
DSMES improves hemoglobin A1C by as much as 1% and has been shown to be cost-effective by reducing hospital admissions.(2, 3) Studies have found that DSMES is associated with improved diabetes knowledge and self-care behaviors (4), lower A1C (5-6), lower self-reported weight (9, 11), improved quality of life (6, 9), reduced all-cause mortality risk (10), healthy coping (11), and reduced health care costs (12-14). Despite this fact, there are limited educational programs in the Islamic Republic of Iran for PWD and no national standard DSMES protocol has been implicated in the country (15) and access to structured DSMES is limited to capital.

Addressing Low Utilization of DSMES

Despite the fact that DSMES is such a critical resource to help PWD successfully self-manage their disease, its utilization is too low (13, 17). As there are limited DSMES programs available in Iran (15), so it seems limited access to DSMES can be a reason for its utilization. Based on a systematic review by Horigan et al. logistical and financial reasons are among the reasons why patients referred to diabetes education programs choose not to attend. So it is crucial to provide New and innovative methods of delivering diabetes education which address the needs of PWD whilst maintaining quality and efficiency. (17)
As technology has been integrated into our daily life, we can use it as a way to deliver DSMES for PWD in remote areas. Systematic review by Verhoeven et al. showed both teleconsultation and videoconferencing are practical, cost-effective, and reliable ways of delivering a worthwhile health care service to PWD.(18) GDEA has recently been started a program to make DSMES available all over the country, named peer support integrated tele-education for people with T1DM (PSITE-1).

Introducing PSITE-1

Peer support integrated tele-education for people with T1DM (PSITE-1) is a project started in 2017 to expand DSMES across the country in Iran. It uses skype to provide interactive group based diabetes education via videoconferencing and a messenger application to provide peer support for all participant in a group. All children and adult aged 30 and younger with an established T1DM diagnosis were recruited and registered by their physician. The course was offered to the patients regardless of age, time from diagnosis or level of glycemic control. No literacy or numeracy requirements were specified to attend PSITE-1 program.

Since using technology is still challenging in our country and many people are not familiar with videoconferencing, we identified a role as the local diabetes education instructor. He or she is a nurse in hospital or a secretary in a clinic who works with local pediatric endocrinologists. All participants will be informed and registered by a local diabetes education instructor. GDEA will contact them regarding class schedule. During one week, they will attend three sessions every other day. Each session will be 3 hours long, making it 9 accumulative hours of group videoconferencing. Each session has unique and specific topics to be covered. (Table 1) as well as homeworks and class activities to engage people with topics.
Sessions were delivered by a senior diabetes educator and trained in GDEA.
Patient would gather at the regional center and the diabetes educator at GDEA will have real-time contact with group through skype videoconferencing.

Session 1	Session 2	Session 3
What is diabetes?	Introduction to Nutrition-1	Healthy Eating and Vegetables
Pathophysiology of Type 1 Diabetes: Focus and Microcomplications	Introduction to carbohydrates and their effect on blood glucose	Blood Glucose Pattern Management
Prevention Studies and Risk in DDS	Carb Counting	Hypoglycaemia
SMBG: Importance and Frequency	Meal Planning with Carb Counting	Hyperglycaemia and DKA
SMBG: Retrieval and Impact	Artificial Sweeteners in Diabetes	Exercise and physical activity
Insulin injection techniques		How to prevent chronic diabetes complication
Hypoglycaemia		Goal setting
		Foot care
		Immunization

Table 1: Topics covered in each session

Peer support can enhance and complement other healthcare services, can provide role-modelling and practical, emotional and ongoing support, and can assist individuals to follow management plans, cope with the stressors of chronic disease and remain motivated. This study supports the use of peer facilitators complementing health professionals, rather than replacing them.(19)

We have utilized "empathy" by peers as a motivating factor for PWD to become active members of their diabetes care team. Every individual with diabetes would be contacted with a well-controlled peer, who has been trained to provide empathy and lead peer support through an empathic communication, interactive motivational interview, and convince the PWD to get involved in the DSMES program.(20)

To make it accessible and available for all PWD, GDEA has provided telephone based, web based and also face-to- face peer support. In PSITE-1 project we provide peer support by a messenger application called telegram. All participants and their family members would be added to the class group and they will share their experiences with each other and peer supporter would moderate the conversation and give personal feedback to each participant.

Figure 1: PSITE-1 Technology Platform: using Skype to provide group education via videoconference and Telegram messenger application to provide peer support for participants.

Results and Conclusion

Psite¹ Project Reach

In the first year, we implemented PSITE-1 courses in 5 centers in 5 different provinces. In the second and third years, we added 6 and 10 more centers in different cities, respectively.
During 107 courses, 2198 people with T1DM and 1373 family members have received DSMES through PSITE-1 project.
In the era of technology, we believe technology would help us expand DSMES across country, PSITE-1 model has been implemented for 2 years. Now we think a well-designed research is necessary to find out whether PSITE-1 is effective in providing clinical, psychological, behavioral & care coordination outcomes including cost reduction in short term & long-term.

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Tailored Diabetes Education

- Patients with T1DM
- Patients with T2DM (Insulin)
- Patients with T2DM (Oral agents)
- Children with T1DM
- Parents of children with T1DM
- Healthcare professionals
- General/at risk population
- Women with GDM

Individualized Education Path

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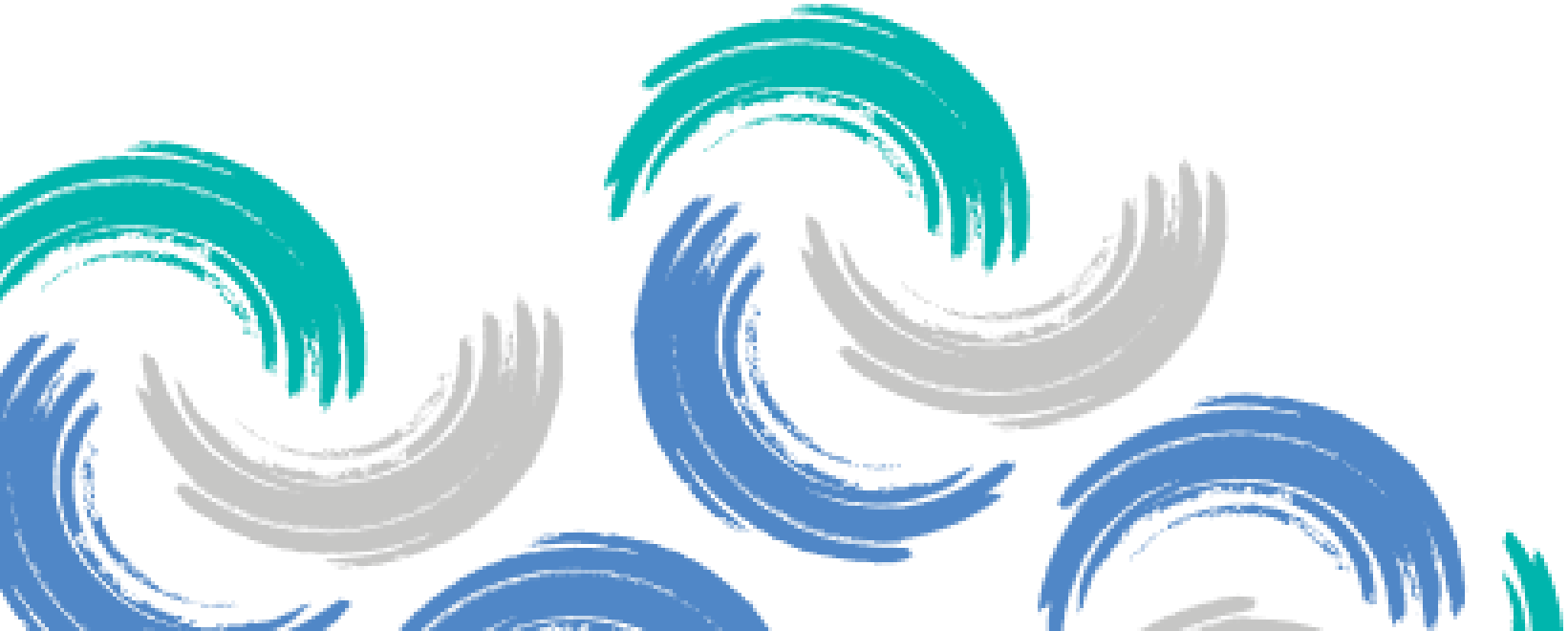
Gabric Diabetes Association

Virtual platform for healthcare training:

Thank you for your attention…



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