A Culturally Grounded mHealth Intervention for Diabetes Self-Management in Vietnamese Patients

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Background & Aims

Asian Americans are 40% more likely to be diagnosed with diabetes than non-Hispanic Whites (NHW) and 60% more likely to be diagnosed with end-stage renal disease.[1] Vietnamese are at greater risk, with 60% higher odds of diabetes compared to NHW.[2]

- Participation in a DSMES program improves quality of life, health outcomes, self-care behaviors and HbA1c.[3,4]
- Language, culture, ethnic differences are some of the barriers to program participation.
- We developed and pilot testing an mHealth intervention to educate and support **d**iabetes **s**elf-**m**anagement for **V**ietnamese with T2D (dsm-V) and utilizing the RE-AIM framework to measure outcomes.

Aim 1: Test the acceptability & feasibility of the dsm-V intervention.
Aim 2: Determine intervention effectiveness & assess its sustainability.

Study Design

Stepped wedge study design with staggered enrollment
(Target N=80 patients in 12 clinics in Central Oklahoma)

Clinics	Months (Each square=1 month)																					
	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24
Clinic 1	T0					T1					T2					T3					T4
Clinic 2	T0					T1					T2					T3					T4
Clinic 3	T0			T0					T1					T2					T3		
Clinic 4	T0			T0					T1					T2					T3		
Clinic 5	T0						T0					T1					T2				
Clinic 6	T0						T0					T1					T2				
Clinic 7	T0				T0					T0					T1					T2	
Clinic 8	T0				T0					T0					T1					T2	
Clinic 9	T0				T0				T0				T0				T1				
Clinic 10	T0				T0				T0				T0				T1				
Clinic 11	T0					T0				T0					T0						T1
Clinic 12	T0					T0				T0					T0						T1

Results 11/8/22-6/19/23 (Study in Progress)

Patient Demographics

Male	Female	Age	Yrs with T2D		Had prior DSMES
N=23 (51.11%)	N=22 (48.89%)	66.71	0-1yrs n=3 (6.67%) 4-5 yrs n=7 (15.56%) 8-9 yrs n=4 (8.89%)	2-3 yrs n=7 (15.56%) 6-7 yrs n=6 (13.33) >9 yrs n=18 (40.00%)	Yes: n=2 (4%) No: n=43 (96%)

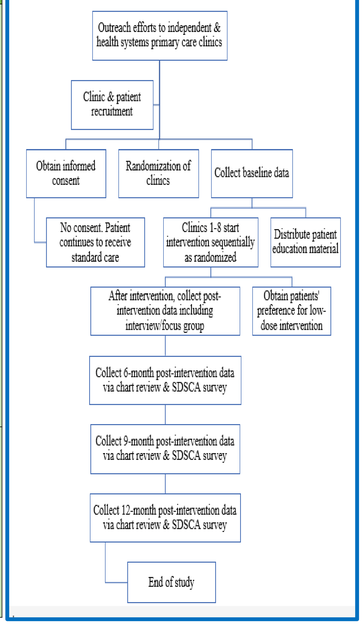
RE-AIM Domain

Reach	Effectiveness @3m F/U (n=22)		Adoption	Implementation
• N=45/80 pts • N=8/12 clinics	HbA1c: 0.59 BMI: 0.40	LDL: 0.50 HDL: 0.36	67% clinics enrolled	• Nurse checklist • Daily SMS
• Barrier: Health system approval (clinic); research hesitation (pt) • Facilitator: MD referrals (pt)	Triglyceride: 0.63 Weight: 0.59 SDSCA Questionnaire: Diet: 0.36 Exercise: 0.18	BP: 0.59 Monitor: 0.31 Foot care: 0.40	• Barrier: Paper chart (clinic); no cell phone (pt) • Facilitator: Service/resource (clinic & pt)	• Barrier: Staff time (clinic); time for nurse call (pt) • Facilitator: SMS with return (pt)

Methods & Study Procedures

	V-dm Intervention	RE-AIM Domain	Outcomes
Aim 1	❖Printed handbook, daily SMS, & weekly coaching nurse calls. ❖12 weeks of synchronous & asynchronous intervention. ❖Empowerment & Health Belief Model. ❖A low-dose of SMS & nurse call after 12 weeks (Nudge Theory).	❖Reach: Absolute number of participants in the intervention. ❖Adoption: Intervention adoption at clinic and patient level. ❖Implementation: Key features of program delivery. ❖Maintenance: Clinics sustain the program & patients maintain improved outcomes.	Reach: • % of participants responded to ≥50% SMS & nurse calls at end of program. • Barriers & facilitators to reach. Adoption: • % of eligible clinic sites who participated. • Barriers and facilitators to adoption. Implementation: • Fidelity to the protocol. • Barriers & facilitators to implementation. Maintenance: • Sustainability of intervention. • Sustainability of improved outcomes.
Aim 2	❖Evaluates pre- and post-intervention measures at 3, 6, 9, and 12 months from baseline.	❖Effectiveness: Modification in self-care (SDSCA scale) and improvement in biological markers (HbA1c, BP, BMI, & lipid).	Effectiveness: • Changes in SDSCA scale. • Changes in HbA1c, triglyceride, LDL, HDL, BMI, BP, weight. • % of patients enrolled at end of study period.

Figure 1. Study procedures.



Lessons Learned

- Impact of culture on study design
- Strengths & limits of the stepped wedge
- Relevancy of intervention development
- Teaching & learning modalities
- Value of health outcome measures
- Collaboration with large health systems
- Challenges & facilitators with solutions for:
  - ✓ Technical problem with mHealth
  - ✓ Practical problem with recruitment & enrollment
  - ✓ Methodological problem with 1:1 consultation
  - ✓ Implementation problem with internet & data
  - ✓ Acknowledgement of clinic staff time

Conclusions

- This study addresses the urgent need to evaluate linguistically and culturally relevant diabetes intervention that maximizes self-care behaviors and maintains clinical effectiveness among ethnic minority populations.
- This is the first Vietnamese diabetes intervention that leverages mHealth technology to address the barriers through collaborating with primary care clinics.
- Successful study results may be implemented across other localities and states and across both primary care and specialty clinics.

Acknowledgements

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