Supplementary Materials

Supplemental Table S1 the number of participants in each cluster

CHC	UCG	SSG	ASG
CHC 1	20	20	21
CHC 2	20	20	20
CHC 3	22	20	21
CHC 4	20	20	23
CHC 5	20	21	21
CHC 6	18	18	19
Total	120	119	125

Supplemental Table S2. Interventions for patients in UCG, SSG and ASG.

Groups	Contents	Approaches
UCG	DSM education	Provision diabetes knowledges: ● Receiving health education on DSM from community doctor every 3 months; ● Receiving a booklet about DSM knowledge.
	DSM support	None
SSG	DSM education	Provision health knowledges and skills: ● Health education on DSM from community doctors in 8 intervention sessions; ● A group behavior changes goal and action plan.
	DSM support	Stressed on problem-solving: ● Sharing barriers in conducting action plan, a group discussion focusing on problem solving; ● A handbook was given to family members on how to offer the support to diabetes.
ASG	DSM education	Provision health knowledge and skills, more stressed on autonomy and self-determined: ● Provision a clear reason why the behavior should be taken; ● Offering an optional list for patient to conduct DSM behaviors self-evaluation; ● Personalized goal and action plan was set based on patients' self-evaluation.
	DSM support	Offering supports base on patients' needs, foster patients' competence and relatedness: ● Based on action plan, patients were encouraged to found out what kind of supports were needed from their family; ● When having obstacles in conducting the action plan, patients could put forward the solutions by themselves, or they could seek advices from peers; ● The doctors, family members and peer leaders should minimize the pressure and acknowledge patients' feelings and perspectives while providing support.

Supplemental Table S3 Items for measuring DSM behaviors

DSM behaviors	Items
Diet	1. In past 3 months, did you control the total amount of your daily diet according to the requirements of your doctor or dietitian? 2. In past 3 months, did you eat low-fat diet according to the requirements of your doctor or dietitian?
Exercise	1. In past 3 months, did you do moderate intensity exercises (e.g. jogging) for more than 30min a day and 5 days a week? 2. Did you carry some snacks (e.g. candy) with during exercise in case of hypoglycemia?
Medication	Did you take the medicine or inject insulin according to your doctor's requirement?
Glucose	1. Did you monitor your blood glucose according to your doctor's requirement?

monitoring	2. Did you test HbA_{1c} every 3-6 months?

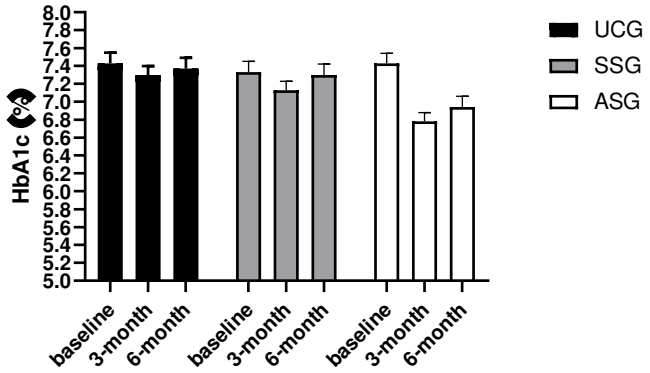
Options and scoring criteria: never = 0.2, rarely = 0.4, sometimes = 0.6, often = 0.8, always = 1.0.

Supplemental Table S4 Changes in clinical and DSM behavior outcomes over time

Outcome	Baseline	3 months-baseline	6month-baiseline
HbA1c (%)			
UCG	7.28 (6.84, 7.72)	-0.15 (-0.34, 0.41)	-0.05 (-0.29, 0.19)
SSG	7.46 (6.94, 7.99)	-0.21 (-0.38, -0.03) *	-0.04 (-0.28, 0.20)
ASG	7.50 (7.17, 7.83)	-0.71 (-0.93, -0.49) ***	-0.52 (-0.77, -0.27) ***
SSG vs. UCG		-0.05 (-0.33, 0.23)	0.01 (-0.34, 0.36)
ASG vs. UCG		-0.55 (-0.83, -0.28) ***	-0.47 (-0.81, -0.13) **
ASG vs. SSG		-0.50 (-0.92, -0.08) *	-0.48 (-0.90, -0.06) *
HbA1c (mmol/mol)			
UCG	56.11 (51.30, 60.97)	-1.66 (-3.76, 0.44)	-0.58 (-3.21, 2.05)
SSG	58.07 (52.29, 63.85)	-2.24 (-4.13, -0.37) *	-0.47 (-3.10, 2.15)
ASG	58.49 (54.88, 62.11)	-7.73 (-10.12, -5.31) ***	-5.71 (-8.44, -2.98) ***
SSG vs. UCG		-0.59 (-3.65, 2.47)	0.11 (-3.68, 3.90)
ASG vs. UCG		-6.07 (-9.10, -3.04) ***	-5.13 (-8.87, -1.38) **
ASG vs. SSG		-5.48 (-10.08, -0.88) *	-5.24 (-9.83, -0.64) *
Diet			
UCG	1.39 (1.26, 1.53)	0.04 (-0.03, 0.11)	0.09 (0.02, 0.17) *
SSG	1.52 (1.36, 1.66)	0.03 (-0.04, 0.09)	0.06 (0.01, 0.13) *
ASG	1.49 (1.43, 1.56)	0.09 (0.02, 0.15) **	0.13 (0.05, 0.20) **
SSG vs. UCG		-0.02 (-0.11, 0.08)	-0.03 (-0.13, 0.07)
ASG vs. UCG		0.05 (-0.05, 0.14)	0.03 (-0.07, 0.13)
ASG vs. SSG		0.06 (-0.06, 0.18)	0.07 (-0.05, 0.18)
Exercise			
UCG	1.45 (1.31, 1.59)	-0.10 (-0.17, -0.05) **	-0.05 (-0.13, 0.03)
SSG	1.31 (1.13, 1.49)	0.01 (-0.06, 0.08)	-0.04 (-0.12, 0.04)
ASG	1.36 (1.21, 1.50)	0.11 (0.04, 0.18) **	0.16 (0.08, 0.23) ***
SSG vs. UCG		0.11 (0.02, 0.21) *	0.01 (-0.10, 0.12)
ASG vs. UCG		0.21 (0.12, 0.30) ***	0.20 (0.10, 0.31) ***
ASG vs. SSG		0.10 (-0.04, 0.24) *	0.20 (0.06, 0.33) ***
Medication			
UCG	0.87 (0.80, 0.94)	0.00 (-0.03, 0.04)	0.00 (-0.04, 0.04)
SSG	0.86 (0.81, 0.90)	-0.01 (-0.03, 0.02)	-0.03 (-0.06, 0.00)
ASG	0.87 (0.81, 0.93)	-0.01 (-0.04, 0.03)	0.02 (-0.02, 0.06)
SSG vs. UCG		-0.01 (-0.05, 0.03)	-0.03 (-0.08, 0.02)
ASG vs. UCG		-0.01 (-0.05, 0.04)	0.02 (-0.03, 0.07)
ASG vs. SSG		0.00 (-0.05, 0.05)	0.05 (-0.01, 0,10)
Glucose monitoring			
UCG	1.39 (1.21, 1.56)	0.04 (-0.02, 0.11)	0.03 (-0.05, 0.10)
SSG	1.34 (1.14, 1.54)	0.08 (0.02, 0.13) **	0.04 (-0.03, 0,12)
ASG	1.30 (1.17, 1.42)	0.09 (0.02, 0.16) *	0.08 (0.00, 0.16)
SSG vs. UCG		0.03 (-0.06, 0.13)	0.01 (-0.10, 0.12)
ASG vs. UCG		0.05 (-0.04, 0.14)	0.06 (-0.06, 0.17)
ASG vs. SSG		0.02 (-0.12, 0.15)	0.04 (-0.10, 0.18)

Data were estimated for means (95%CI). The data of within-group adjusted for baseline value, and the data of between-group were adjusted for baseline and basic characteristics.

* P < 0.01 , ** P < 0.05 , *** P < 0.001.



Supplemental Figure 1. The changes of HbA1c from baseline to 6 months.