

Effectiveness of telephone call interventions in promoting glycaemic control and selfmanagement among Type 2 diabetes patients: a systematic review and meta-analysis

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Introduction

- People with Type 2 diabetes mellitus (T2DM) need support and teaching to improve their health outcomes and prevent costly nerve, kidney, heart and blood vessels complications¹.
- In this era of COVID-19 pandemic, where individuals with diabetes are vulnerable, it is incumbent to explore the effectiveness of avenues for remote continual education and support.
- Aim of the review: Evaluate the impact of direct dinician telephone interventions compared to usual care on glycated hae moglobin (HbA1c) and self-management guidelines a mong individuals living with T2DM.

Methods

- Electronic databases such as MEDLINE, GNAHL, Embase, PsydNFO, Web of Science, and the Cochrane Library were searched from January 2002 to January 2020 (PROSPERO ID: CRD42020167801).
- Eligibility criteria included RCTs of telephone or mobile phone call interventions involving diabetes self-management education and support delivered by clinicians for adults with T2DM aged at least 18 years reporting changes in glycated haemoglobin (HbA1c) and adherence to self-management practices outcomes.
- Review authors independently assessed risk of bias², extracted relevant data from included studies and pooled HbA1c changes presented as forest plots.

Results

- 15 studies provided adequate information on 3612 participants for meta-analysis.
- Interventionists: certified diabetes educators, nurses, physicians, pharmacists, and dieticians delivered direct telephone support sessions in addition to routine clinics.
- Control group received the usual care (routine clinics).
- Risk of bias was generally low across the trials. Performance bias is ranked high due to the impossibility of blinding human telephone interventions (Figure C).
- Overall, telephone interventions at a median follow-up duration of 9 months led to a mean HbA1c change of -0.51% (95% CI: -0.66 to -0.35; P<0.00001) (Figure A).
- Sub-group analysis: highly intensive frequency of at least once a week dinician calls over 3 to 4 months showed greater mean HbA1c reduction of -0.75% (95% Cl: -1.14 to -0.36; P=0.0002) in favour of the intervention (Figure B) while low intensive monthly calls for 12 months yiel ded a lower effect of -0.43% (95% Cl: -0.64 to -0.22; P=0.0005).
- Telephone group had statistically significant improvements in self-care activities (healthy diet, physical activity, medication, blood glucose monitoring and foot care adherence) than the usual care group across most of the studies.

Conclusions

- The meta-analysis shows that telephone or mobile phone call interventions providing continuing education and support delivered intensively can promote glycaemic control and self-management a mong adults with T2DM.
- It is imperative for policymakers to consider these remote avenues in achieving better diabetes outcomes.

References

further.	

	Telephon	interve	ntion	C	ontro			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
1.1.1 Change in mean	1								
Aguiar 2016	-0.79	0.86	36	-0.16	1.08	37	6.1%	-0.63 [-1.08, -0.18]	
Dobler 2018	-0.68	1.4	91	0.12	1.7	94	6.1%	-0.80 [-1.25, -0.35]	
Parsons 2019	-1.17	1.21	108	-0.3	1.25	116	8.1%	-0.87 [-1.19, -0.55]	
Walker 2011	-0.23	0.11	228	0.13	0.13	216	12.5%	-0.36 [-0.38, -0.34]	•
Subtotal (95% CI)			463			463	32.8%	-0.63 [-0.95, -0.31]	◆
Heterogeneity: Tau ² =	0.08; Chi2	= 14.59,	df = 3 (F	P = 0.00	02); I ²	= 79%			
Test for overall effect:	Z = 3.90 (F	P < 0.000	1)						
1.1.2 Mean difference									
Browning 2016	6.67	1.69	295	6.64	1.59	282	9.1%	0.03 [-0.24, 0.30]	
Chamany 2015	8.4	1.9	334	8.6	2	360	8.7%	-0.20 [-0.49, 0.09]	
Kanadli 2016	7.5	0.7	44	7.9	1.5	44	5.6%	-0.40 [-0.89, 0.09]	
Kim 2003	7.6	1	20	8.8	0.9	16	4.1%	-1.20 [-1.82, -0.58]	
Moriyama 2009	6.85	1.04	42	7.25	1.27	23	4.3%	-0.40 [-1.01, 0.21]	
Nesari 2010	7.04	1.18	30	8.6	1.88	30	2.9%	-1.56 [-2.35, -0.77]	
Odnoletkova 2016	6.8	0.9	252	7	1.1	260	10.8%	-0.20 [-0.37, -0.03]	
Sarayani 2018	6.97	1.14	40	7.09	1.78	44	4.0%	-0.12 [-0.75, 0.51]	
Shahid 2014	8.63	1.29	220	9.36	1.15	220	9.8%	-0.73 [-0.96, -0.50]	
Varney 2014	7.7	1.16	38	8.5	0.89	43	6.0%	-0.80 [-1.25, -0.35]	
Wolever 2010	8.3	1.76	27	8.8	1.99	22	1.8%	-0.50 [-1.56, 0.56]	
Subtotal (95% CI)			1342			1344	67.2%	-0.49 [-0.73, -0.24]	•
Heterogeneity: Tau ² =	0.11; Chi ²	= 42.69,	df = 10	(P < 0.0)	00001	$; ^2 = 7$	7%		
Test for overall effect:	Z = 3.91 (F	? < 0.000	1)						
Total (95% CI)			1805			1807	100.0%	-0.51 [-0.66, -0.35]	◆

100a (1975 €.1) Heterogeneity: Tau² = 0.05; Chi² = 57.28, df = 14 (P < 0.00001); i² = 76% Test for overall effect: Z = 6.43 (P < 0.00001) Test for subgroup differences: Chi² = 0.52, df = 1 (P = 0.47), i² = 0% Favours [Intervention] Favours [Control]

Figure A: Forest plots howing the pooled results from HbA1c comparison at follow-up between intervention and control

	Telephon	e interve	ntion	Control			Mean Difference		Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Kanadli 2016	7.5	0.7	44	7.9	1.5	44	21.5%	-0.40 [-0.89, 0.09]	
Kim 2003	7.6	1	20	8.8	0.9	16	17.8%	-1.20 [-1.82, -0.58]	_ -
Nesari 2010	7.04	1.18	30	8.6	1.88	30	13.8%	-1.56 [-2.35, -0.77]	
Sarayani 2018	6.97	1.14	40	7.09	1.78	44	17.5%	-0.12 [-0.75, 0.51]	
Shahid 2014	8.63	1.29	220	9.36	1.15	220	29.4%	-0.73 [-0.96, -0.50]	-
Total (95% CI)			354			354	100.0%	-0.75 [-1.14, -0.36]	•
Heterogeneity: Tau ² =	0.12; Chi ² :	= 11.68,							
Test for overall effect:	Z = 3.79 (P	= 0.000	-2 -1 U I Z						

Figure B: Forest plot of pooled results from studies delivering high call frequencies



Figure C: Review authors' judgements a bout each risk of bias item presented as percentages across all included studies

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