TELEMONITORAMENTO DO IDOSO NÃO HOSPITALIZADO: EVIDÊNCIAS E PERSPECTIVAS

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Disciplina de Gerontologia

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DECLARAÇÃO DE CONFLITO DE INTERESSE

De acordo com a ***norma 1595/2000*** do Conselho Federal de Medicina e a ***Resolução*** da Diretoria Colegiada ***96/2008*** da Agência Nacional de Vigilância Sanitária, declaro que:

NÃO TENHO CONFLITOS DE INTERESSES

TELEMONITORAMENTO

Uso de **sensores remotos** para medir **sinais vitais** como Pressão arterial, Frequência cardiaca, Função respiratória, peso e nivel de glicemia.

A **informação** é então enviada ***via internet*** para a equipe de profissionais de saúde.

Celler et al. BMC Public Health 2014, 14:1270 Page 8 of 16
http://www.biomedcentral.com/1471-2458/14/1270

TELEMONITORAMENTO

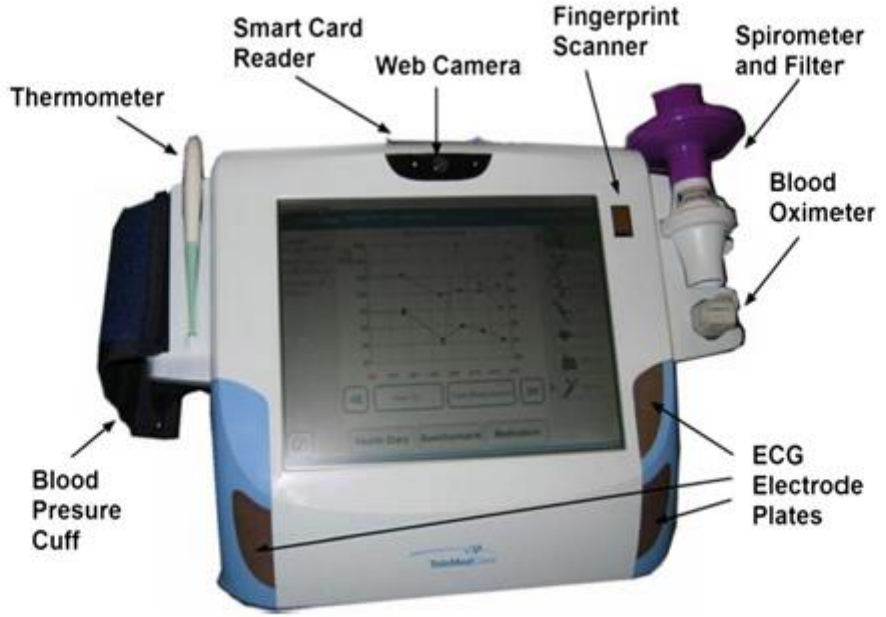


Figure 3 Telemedcare Clinical Monitoring Unit (CMU).

Celler et al. BMC Public Health 2014, 14:1270 Page 8 of 16
http://www.biomedcentral.com/1471-2458/14/1270

TELEMONITORAMENTO

Os dados podem ser observados ao vivo como parte de um ***exame remoto***, ***armazenados*** e usados para criar ***um histórico*** de pacientes, ou ***alertar*** profissionais da saúde e cuidadores para ***degradações súbitas*** na condição de um paciente.

Celler et al. BMC Public Health 2014, 14:1270 Page 8 of 16
http://www.biomedcentral.com/1471-2458/14/1270

EVIDÊNCIA DO TLM EM DOENÇAS CRÔNICAS

15% redução em visitas de ***emergência***

20% redução nas ***admissões*** hospitalares

14% redução nas admissões ***eletivas***

14% redução de dias em ***leito hospitalar***

8% redução no ***custo*** de impostos

45% redução nas taxas de ***mortalidade***

UK Government, Department of Health: Whole system demonstrator programme: headline findings. 2011, [https://www.gov.uk/government/publications/whole-system-demonstrator-programme-headline-findingsdecember-2011]

TLM E HOSPITALIZAÇÕES E LEITOS DIA

Finkelstein et al. (2006)	Physiological monitoring, video visits	Heart disease, lung disease, chronic wounds	Hospital and nursing home admissions reduced by 58% vs. control
Johnston et al. (2000)	Video visits	Heart disease, lung disease, diabetes, chronic wounds	Reduced hospitalization expenses by 44% vs. control
Meyer, Cobb, and Ryan (2002)	Physiological monitoring, video visits, messaging	Heart disease, lung disease, diabetes, chronic wounds	Reduced BDOC by 52% vs. control.
Montefiore Care Connect (interview, 2008)	Physiological monitoring, telephone visits, messaging	Heart disease, lung disease, diabetes	Reduced hospitalization and ER costs by 40%
Noel et al. (2004)	Physiological monitoring, remote wound camera	Heart disease, lung disease, diabetes, chronic wounds	Reduced BDOC by 19% vs. control
Rees and Bashshur (2007)	Remote wound camera	Chronic wounds	Reduced BDOC by 45% vs. control
Strategic Healthcare Programs, LLC (2004)	Physiological monitoring	Heart disease, lung disease, diabetes	Reduced hospitalizations by 39% for CHF patients, 51% for COPD patients, and 75% for diabetes patients
Trappenburg et al. (2008)	Remote messaging	Lung disease	Reduced hospitalization by 41% vs. control

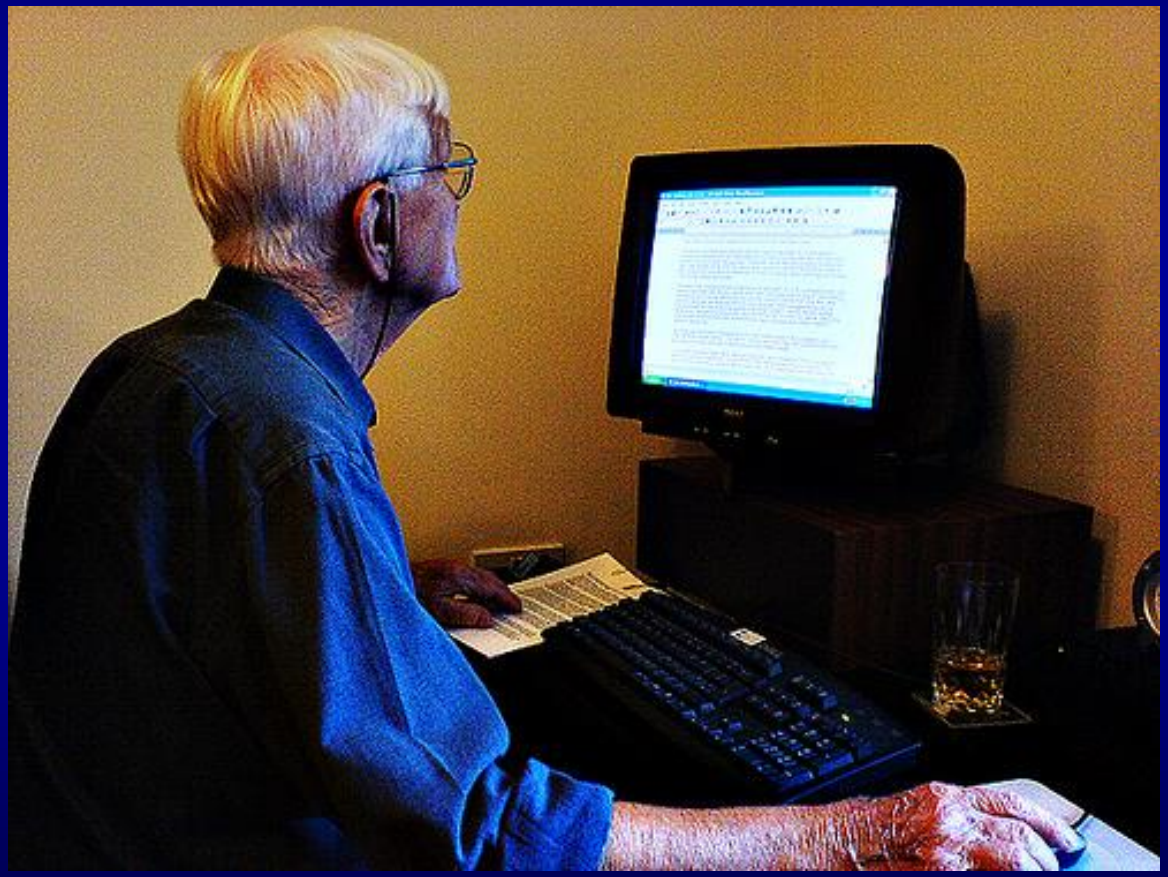
Litan RE: Vital Signs Via Broadband: Remote Health Monitoring Transmits Savings, Enhances Lives. 2008, [http://www.corp.att.com/healthcare/docs/litan.pdf]

TLM E ADMISSÕES EM ILPIS

Authors	Intervention	Disease Groups	Result
Finkelstein et al. (2006)	Physiological monitoring, video visits	Heart disease, lung disease, chronic wounds	Hospital and nursing home admissions reduced by 58% vs. control
Meyer, Cobb, and Ryan (2002)	Physiological monitoring, video visits, messaging	Heart disease, lung disease, diabetes, chronic wounds	Reduced nursing home BDOC by 68% vs. control.

Litan RE: Vital Signs Via Broadband: Remote Health Monitoring Transmits Savings, Enhances Lives. 2008, [http://www.corp.att.com/healthcare/docs/litan.pdf]

CASO CLÍNICO



CASO CLÍNICO

Sr C é um idoso de ***90 anos***!

Cinco anos atrás sofreu um ***IAM extenso***

Atualmente é portador de ***ICC*** compensada

O Sr C manifesta o desejo de se a ICC descompensar ***não gostaria*** mais de retornar ao ***hospital*** e que prefere ***morrer em casa.***

CASO CLÍNICO

Então o Sr C é encaminhado a um ***programa de telemonitoramento*** de doenças crônicas como a ICC.

Passou a se exercitar uma hora e meia todos os dias.

CASO CLÍNICO

O programa de telemonitoramento utiliza basicamente uma ***balança*** ligada a uma tomada e a uma linha telefônica.

Todas as manhãs as ***informações*** chegam aos computadores da equipe de telemonitoramento.

CASO CLÍNICO

Fora dito ao Sr C que o ***monitoramento*** de seus ***dados vitais*** incluindo seu ***peso*** poderia impedi-lo de retornar ao hospital.

O Sr C comprou a ideia e passou a se pesar diariamente.

Seu ***peso*** estava sempre ***estável.***

CASO CLÍNICO

Mas ,

Numa segunda feira seu ***peso aumentou 3 Kilos***, a equipe de telemonitoramento ligou imediatamente pra ele:

_***O que o Sr Fez?***

O Sr C contou que saíra pra jantar no final de semana com seus netos!

CASO CLÍNICO

Exagerou um pouco na alimentação.

Comeu galinha frita e tomou ***algumas sodas***.

A Equipe o chamou para e administrou doses extras de diuréticos!

E funcionou!

Seu ***peso retornou ao normal*** no dia seguinte!

Evitando que o Sr C fosse ***hospitalizado***.

CASO CLÍNICO

Agora o Sr C esta com ***92 anos*** e participa de grupos de apoio a portadores de ***ICC***.

Ele mostra seu exemplo a outros portadores de ICC mais jovens.

Mantem sua ***atividade física*** e seu ***telemonitoramento!***

TLM NA ICC

Evaluating the Evidence Base for the Use of Home Telehealth Remote Monitoring in Elderly with Heart Failure

Stuti Dang, M.D., M.P.H.,[1–3] Susan Dimmick, Ph.D.,[4] and Geetanjali Kelkar, M.B.B.S.[1,2]

[1]Geriatric Research, Education, and Clinical Center (GRECC) and Extended Care and Research Services, Bruce W. Carter Department of Veterans Affairs Medical Center, Miami, Florida.
[2]The Geriatrics Institute and [3]Department of Medicine, University of Miami Miller School of Medicine, Miami, Florida.
[4]University of Tennessee, School of Information Sciences, Knoxville, Tennessee.

number of Emergency Department visits. Three two-arm studies and one three-arm study demonstrated significant overall improvement in outcomes with use of telemonitoring. Available data suggest that telemonitoring is a promising strategy. More data are needed to determine the ideal patient population, technology, and parameters, frequency and duration of telemonitoring, and the exact combination of case management and close monitoring that would assure consistent and improved outcomes with cost reductions in HF.

Key words: *heart failure, telemonitoring, home telehealth, case management*

DOI: 10.1089/tmj.2009.0028 © MARY ANN LIEBERT, INC. • VOL. 15 NO. 8 • OCTOBER 2009 **TELEMEDICINE and e-HEALTH**

Table 3. Summary of Outcomes in Randomized Controlled Studies with Two–Arm Study Design *Continued*

	BENETAR ET AL. (2003)	GOLDBERG ET AL. (2003)	GIORDANO ET AL. (2007)	WOODEND ET AL. (2008)	KASHEM ET AL. (2008)
Readmissions	Lower readmission rates at 6 and 12 months for intervention group. 6 months: 38 (I) vs. 63 (UC) = 40% reduction, $p \leq 0.05$. 12 months: 75 (I) vs. 103 (UC) = 27% reduction, $p = 0.12$	No significant difference between groups	38% reduction in overall readmission rates in the intervention group: 91 (I) vs. 142 (UC), $p < 0.01$	No significant difference per patient between groups: 0.46 (I) vs. 0.49 (UC) at 3 months (6% reduction); 0.96 (I) vs. 0.92 (UC) at 1 year (4.17% increase)	40% decline in overall admissions in intervention group: 24 (I) vs. 40 (UC), $p = 0.025$
HF-related readmissions	Fewer HF-related admissions in the intervention group at 3 months: 13 (I) vs. 24 (UC) = 46% reduction, $p < 0.001$	No significant difference between groups	HF-related readmissions fewer in the intervention group: 43 (I, 19%) vs. 73 (UC, 32%) = 40% reduction (RR 0.43, 95% CI = 0.031–0.76, $p = 0.0001$)		
ED visits		No significant difference between groups		No significant difference between groups at 3 months or 1 year	Fewer in the intervention group: 5 (I) vs. 12 (UC) = 58% reduction, $p < 0.05$
Length of stay	Shorter hospital stay in the intervention group: 49.5 days (I) vs. 105.0 days (UC) = 53% reduction, $p \leq 0.001$ at 3 months	No significant difference between groups		No significant difference between groups: 2.69 (I) vs. 3.75 (UC) at 3 months = 28.5% reduction; 7.13 (I) vs. 6.71 (UC) at 1 y = 6.2% increase	Shorter in the intervention group: 84 (I) vs. 226 (UC) = 62% reduction, $p < 0.005$
Mortality		56.2% reduction in the intervention group at 6-month follow-up ($p < 0.003$)	1-year mortality lower in the intervention group: 9% (I) vs. 14% (UC) = 36% reduction; cardiovascular mortality also lower: 18 (8%, I) vs. 29 (13%, UC) = 38% reduction, RR = 0.44, $p = 0.04$		
Cost	Lower admission charges in the intervention group. At 3 months, $65,023 (I) vs. $177,365 (UC) = 63% reduction, $p \leq 0.02$. At 6 months, $223,638 (I) vs. $500,343 (UC) = 55% reduction, $p < 0.3$). At 12 months, $541,378 (I) vs. $677,710 (UC) = 20% reduction, $p \leq 0.16$		Mean cost of hospital readmission significantly lower in the intervention group: €843 ± 1,733 (I) vs. €1,298 ± 2,322 (UC) = 35% reduction, $p < 0.01$		

PREVENÇÃO DOENÇA CV

MAYO CLINIC

ORIGINAL ARTICLE

Digital Health Interventions for the Prevention of Cardiovascular Disease: A Systematic Review and Meta-analysis

R. Jay Widmer, MD, PhD; Nerissa M. Collins, MD; C. Scott Collins, MD; Colin P. West, MD, PhD; Lilach O. Lerman, MD, PhD; and Amir Lerman, MD

2015 Mayo Foundation for Medical Education and Research n Mayo Clin Proc. 2015;90(4):469-480

Study or subgroup	Digital health Events	Digital health Pts	Usual care Events	Usual care Pts	Weight (%)	Risk ratio IV, random (95% CI)
Primary prevention						
Appel 2011	15	139	15	138	12.8	0.99 (0.51-1.95)
Green 2012	10	520	2	258	3.2	2.48 (0.55-11.24)
Subtotal (95% CI)		**659**		**396**	**16.0**	**1.21 (0.58-2.54)**
Total events	25		17			
Heterogeneity: τ^2=0.06; χ^2=1.18, *df*=1 (*P*=.28); I^2=15%						
Test for overall effect: *z*=0.51 (*P*=.61)						
Secondary prevention						
Blasco 2012	3	102	8	101	4.2	0.37 (0.10-1.36)
Frederix 2013	4	40	9	40	5.7	0.44 (0.15-1.33)
Reid 2012	4	115	9	108	5.3	0.42 (0.13-1.32)
Southard 2003	2	53	8	51	3.2	0.24 (0.05-1.08)
Vernooij 2012	32	164	45	166	25.6	0.72 (0.48-1.07)
Subtotal (95% CI)		**474**		**466**	**44.0**	**0.60 (0.43-0.83)**
Total events	45		79			
Heterogeneity: τ^2=0.00; χ^2=3.42, *df*=4 (*P*=.49); I^2=0%						
Test for overall effect: *z*=3.04 (*P*=.002)						
Heart failure						
Dendale 2012	23	80	48	80	26.3	0.48 (0.32-0.71)
Scherr 2009	11	54	18	54	13.7	0.61 (0.32-1.17)
Subtotal (95% CI)		**134**		**134**	**40.0**	**0.51 (0.37-0.71)**
Total events	34		66			
Heterogeneity: τ^2=0.00; χ^2=0.40, *df*=1 (*P*=.53); I^2 = 0%						
Test for overall effect: *z*=3.95 (*P*<.001)						
Total (95% CI)		**1267**		**996**	**100.0**	**0.61 (0.46-0.80)**
Total events	104		162			
Heterogeneity: τ^2=0.04; χ^2=10.23, *df*=8 (*P*=.25); I^2=22%						
Test for overall effect: *z*=3.52 (*P*<.001)						
Test for subgroup differences: χ^2=4.35, *df*=2 (*P*=.11); I^2=54.0%						

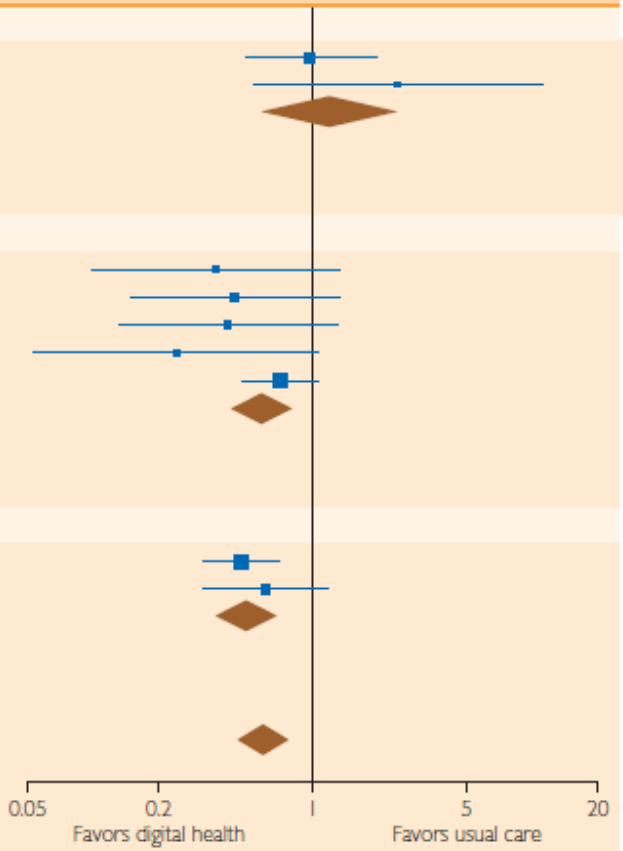


FIGURE 3. Cardiovascular disease outcomes in 9 randomized, controlled trials. Pts = patients.

TLM NA DPOC

Telehealthcare for chronic obstructive pulmonary disease (Review)

McLean S, Nurmatov U, Liu JLY, Pagliari C, Car J, Sheikh A

Telehealthcare for chronic obstructive pulmonary disease (Review)
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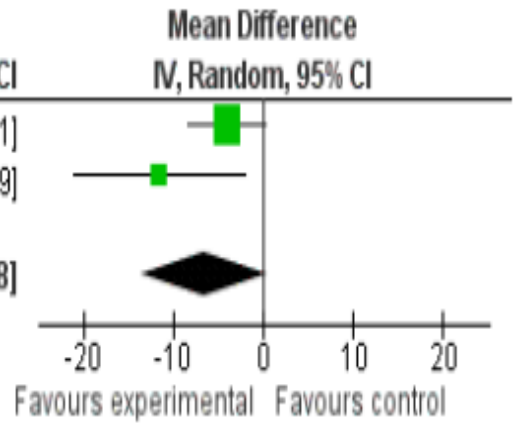
TLM NA DPOC

Figure 2. Forest plot of comparison: 1 Quality of Life, outcome: 1.1 Quality of Life over 12 months.

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
Bourbeau 2003	50.6	16.6	96	54.6	13.7	95	66.2%	-4.00 [-8.31, 0.31]
Casas 2006	37.8	16.9	21	49.4	20.2	41	33.8%	-11.60 [-21.11, -2.09]
Total (95% CI)			**117**			**136**	**100.0%**	**-6.57 [-13.62, 0.48]**

Heterogeneity: $Tau^2 = 14.68$; $Chi^2 = 2.03$, df = 1 (P = 0.15); $I^2 = 51\%$

Test for overall effect: Z = 1.83 (P = 0.07)



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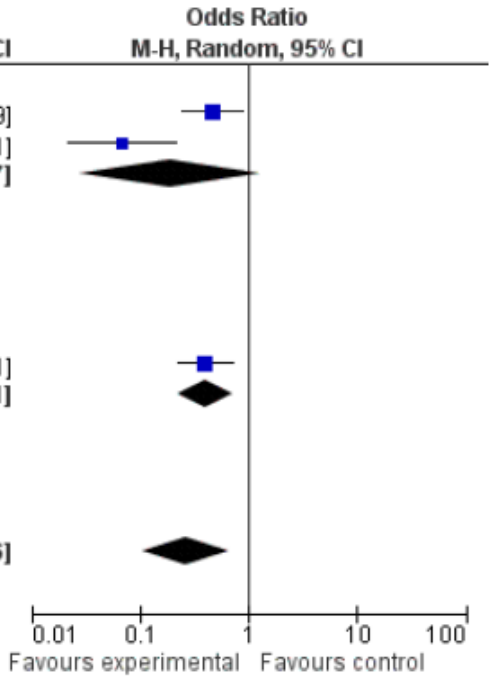
TLM NA DPOC

Figure 3. Forest plot of comparison: 2 Emergency Dept Visits, outcome: 2.1 Number of patients with one or more emergency dept attendance over 12 months.

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Random, 95% CI
2.1.1 Telehealthcare studies						
de Toledo 2006	24	67	49	90	36.3%	0.47 [0.24, 0.89]
Vitacca 2009	23	57	40	44	26.0%	0.07 [0.02, 0.21]
Subtotal (95% CI)		**124**		**134**	**62.3%**	**0.19 [0.03, 1.27]**
Total events	47		89			
Heterogeneity: Tau² = 1.66; Chi² = 8.27, df = 1 (P = 0.004); I² = 88%						
Test for overall effect: Z = 1.72 (P = 0.09)						
2.1.2 Complex intervention studies						
Bourbeau 2003	39	96	60	95	37.7%	0.40 [0.22, 0.71]
Subtotal (95% CI)		**96**		**95**	**37.7%**	**0.40 [0.22, 0.71]**
Total events	39		60			
Heterogeneity: Not applicable						
Test for overall effect: Z = 3.09 (P = 0.002)						
Total (95% CI)		**220**		**229**	**100.0%**	**0.27 [0.11, 0.66]**
Total events	86		149			
Heterogeneity: Tau² = 0.49; Chi² = 8.80, df = 2 (P = 0.01); I² = 77%						
Test for overall effect: Z = 2.84 (P = 0.005)						
Test for subgroup differences: Chi² = 0.54, df = 1 (P = 0.46), I² = 0%						



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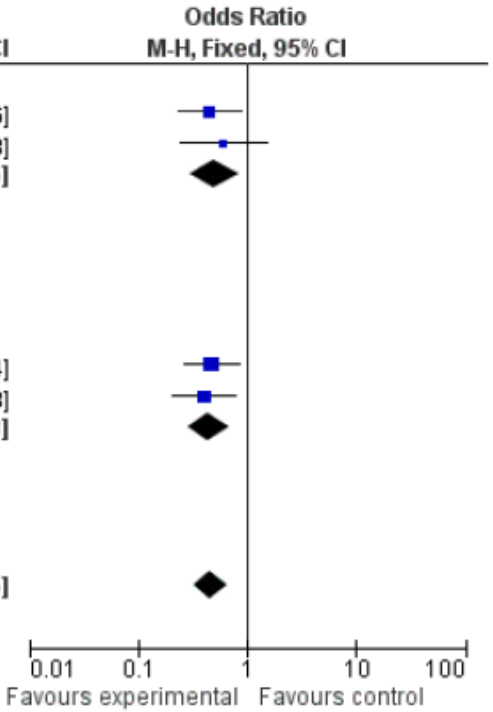
TLM NA DPOC

Figure 4. Forest plot of comparison: 3 Hospitalisations, outcome: 3.2 No. of patients with one or more hospitalisations in 12 months.

Study or Subgroup	Interventions Events	Interventions Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
3.1.1 Telehealthcare						
de Toledo 2006	31	67	59	90	27.2%	0.45 [0.24, 0.86]
Vitacca 2009	40	57	35	44	11.9%	0.61 [0.24, 1.53]
Subtotal (95% CI)		**124**		**134**	**39.1%**	**0.50 [0.29, 0.85]**
Total events	71		94			
Heterogeneity: Chi² = 0.25, df = 1 (P = 0.61); I² = 0%						
Test for overall effect: Z = 2.57 (P = 0.01)						
3.1.2 Complex intervention studies						
Bourbeau 2003	31	96	48	95	32.9%	0.47 [0.26, 0.84]
Casas 2006	29	65	60	90	28.0%	0.40 [0.21, 0.78]
Subtotal (95% CI)		**161**		**185**	**60.9%**	**0.44 [0.28, 0.68]**
Total events	60		108			
Heterogeneity: Chi² = 0.11, df = 1 (P = 0.74); I² = 0%						
Test for overall effect: Z = 3.70 (P = 0.0002)						
Total (95% CI)		**285**		**319**	**100.0%**	**0.46 [0.33, 0.65]**
Total events	131		202			
Heterogeneity: Chi² = 0.50, df = 3 (P = 0.92); I² = 0%						
Test for overall effect: Z = 4.49 (P < 0.00001)						
Test for subgroup differences: Chi² = 0.14, df = 1 (P = 0.71), I² = 0%						



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CONCLUSÕES

TLM na DPOC tem um possível impacto na ***qualidade de vida*** dos pacientes atendidos no departamento de emergência e no hospital. No entanto, são necessárias mais pesquisas para esclarecer precisamente o seu papel.

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TLM E DIABETES

DIABETES RESEARCH AND CLINICAL PRACTICE 106 (2014) 200–211

ELSEVIER

Contents available at ScienceDirect

Diabetes Research and Clinical Practice

journal homepage: www.elsevier.com/locate/diabres

International Diabetes Federation

Review

Online social networking services in the management of patients with diabetes mellitus: Systematic review and meta-analysis of randomised controlled trials

CrossMark

Tania Toma, Thanos Athanasiou, Leanne Harling, Ara Darzi, Hutan Ashrafian *

The Department of Surgery and Cancer, Imperial College London, 10th Floor, Queen Elizabeth the Queen Mother (QEQM) Building, St Mary's Hospital, Praed Street, London W2 1NY, UK

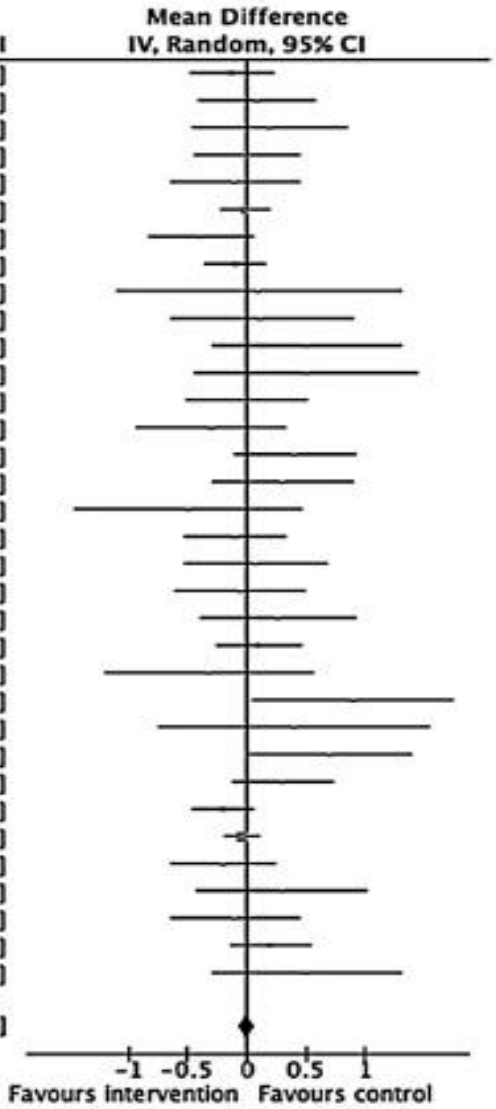
http://dx.doi.org/10.1016/j.diabres.2014.06.008

(a) Baseline HbA1c

Study or Subgroup	Intervention Mean	Intervention SD	Intervention Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
Avdal	8.01	0.98	61	8.14	0.99	61	4.0%	-0.13 [-0.48, 0.22]
Benhamou	8.31	0.65	15	8.22	0.72	15	2.0%	0.09 [-0.40, 0.58]
Cho 2006	7.7	1.5	36	7.5	1.3	35	1.2%	0.20 [-0.45, 0.85]
Cho 2011	8	0.8	32	8	1	32	2.5%	0.00 [-0.44, 0.44]
Farmer	9.2	1.1	47	9.3	1.5	46	1.7%	-0.10 [-0.64, 0.44]
Glasgow	8.14	1.1	120	8.16	0.16	114	12.5%	-0.02 [-0.22, 0.18]
Harno	7.82	1.31	101	8.21	1.55	74	2.6%	-0.39 [-0.83, 0.05]
Holbrook	7	1.4	253	7.1	1.6	258	7.3%	-0.10 [-0.36, 0.16]
Izqierdo	8.7	2.1	19	8.6	1.6	18	0.3%	0.10 [-1.10, 1.30]
Kim	7.99	1.22	28	7.87	1.52	23	0.8%	0.12 [-0.65, 0.89]
Kim H.S 2008	8.09	1.72	25	7.59	1.09	26	0.8%	0.50 [-0.29, 1.29]
Kim H.S. 2007	8.16	1.9	18	7.66	0.7	16	0.6%	0.50 [-0.44, 1.44]
Kim. C	9.8	1.3	47	9.8	1.2	45	1.9%	0.00 [-0.51, 0.51]
Kumar	7.8	1.1	19	8.1	0.9	21	1.3%	-0.30 [-0.93, 0.33]
Kwon	7.59	1.43	51	7.19	1.17	50	1.9%	0.40 [-0.11, 0.91]
Landau	8.5	1.4	36	8.2	1.1	34	1.4%	0.30 [-0.29, 0.89]
Lapp	9.6	1.5	22	10.1	1.8	24	0.5%	-0.50 [-1.45, 0.45]
Lim. S	7.8	1.3	49	7.9	0.8	48	2.7%	-0.10 [-0.53, 0.33]
Liu	9.03	2.79	134	8.95	2.23	140	1.4%	0.08 [-0.52, 0.68]
McCarrier	7.99	1.1	41	8.05	1.3	36	1.7%	-0.06 [-0.60, 0.48]
McKay	7.46	1.35	33	7.2	1.36	33	1.2%	0.26 [-0.39, 0.91]
McMahon	10	1	52	9.9	0.8	52	4.1%	0.10 [-0.25, 0.45]
Moatarri	9.1	1.29	24	9.42	1.78	24	0.6%	-0.32 [-1.20, 0.56]
Mulvaney 2010	9.1	1.9	34	8.2	1.2	18	0.7%	0.90 [0.05, 1.75]
Noh J.H	9	2.3	20	8.6	1.2	20	0.4%	0.40 [-0.74, 1.54]
Quinn	9.9	2.1	62	9.2	1.7	56	1.0%	0.70 [0.01, 1.39]
Ralston	8.2	1.14	39	7.9	0.66	35	2.8%	0.30 [-0.12, 0.72]
Rossi	8.2	0.8	67	8.4	0.7	63	7.4%	-0.20 [-0.46, 0.06]
Shea	7.36	1.48	844	7.4	1.6	821	22.5%	-0.04 [-0.19, 0.11]
Shetty	8.9	1.3	78	9.1	1.4	66	2.5%	-0.20 [-0.64, 0.24]
Tildesley	8.8	1.3	24	8.5	1.2	23	1.0%	0.30 [-0.41, 1.01]
Tjam	6.7	1	37	6.8	1	20	1.7%	-0.10 [-0.64, 0.44]
Yoo	7.6	0.9	57	7.4	0.9	54	4.4%	0.20 [-0.13, 0.53]
Yoon	8.09	1.72	25	7.59	1.09	26	0.8%	0.50 [-0.29, 1.29]
Total (95% CI)			**2550**			**2427**	**100.0%**	**0.00 [-0.07, 0.07]**

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 32.47$, df = 33 (P = 0.49); $I^2 = 0\%$

Test for overall effect: Z = 0.05 (P = 0.96)



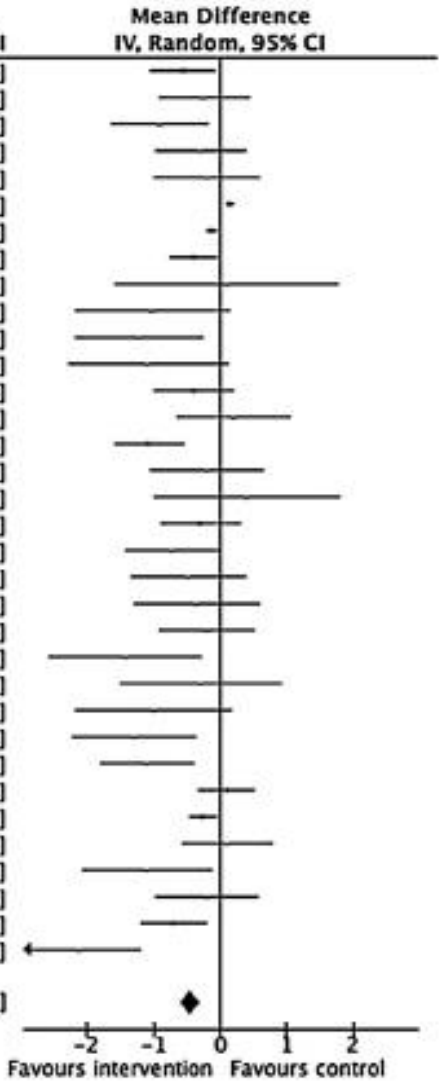
http://dx.doi.org/10.1016/j.diabres.2014.06.008

(c) Change in HbA1c

Study or Subgroup	Intervention Mean	Intervention SD	Intervention Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
Avdal	-0.512	1.21260422	61	0.048	1.51775426	61	4.1%	-0.56 [-1.05, -0.07]
Benhamou	-0.13	0.87783825	15	0.12	0.98351411	15	3.0%	-0.25 [-0.92, 0.42]
Cho 2006	-1	1.74928557	36	-0.1	1.33416641	35	2.7%	-0.90 [-1.62, -0.18]
Cho 2011	-0.5	1.20415946	32	-0.2	1.48660688	32	3.0%	-0.30 [-0.96, 0.36]
Farmer	-0.6	1.78044938	47	-0.4	2.05182845	46	2.5%	-0.20 [-0.98, 0.58]
Glasgow	0.02	0.13453624	120	-0.12	0.21260292	114	7.1%	0.14 [0.09, 0.19]
Harno	-0.5	0.17029386	101	-0.38	0.26907248	74	7.1%	-0.12 [-0.19, -0.05]
Holbrook	-0.2	1.84390889	253	0.2	2.2627417	258	5.1%	-0.40 [-0.76, -0.04]
Izqierdo	-0.9	3.04138126	19	-1	2.06155281	18	0.8%	0.10 [-1.57, 1.77]
Kim	-0.59	1.59665275	28	0.43	2.42538657	23	1.4%	-1.02 [-2.17, 0.13]
Kim H.S 2008	-1.15	2.00997512	25	0.07	1.41992958	26	1.9%	-1.22 [-2.18, -0.26]
Kim H.S. 2007	-1.09	2.42074369	18	0	0.86023253	16	1.3%	-1.09 [-2.29, 0.11]
Kim. C	-2.4	1.47648231	47	-2	1.44222051	45	3.4%	-0.40 [-1.00, 0.20]
Kumar	0.1	1.55563492	19	-0.1	1.14017542	21	2.2%	0.20 [-0.65, 1.05]
Kwon	-0.65	1.43589693	51	0.43	1.17720007	50	4.0%	-1.08 [-1.59, -0.57]
Landau	0	1.97989899	36	0.2	1.55563492	34	2.3%	-0.20 [-1.03, 0.63]
Lapp	0.2	2.12132034	22	-0.2	2.69072481	24	1.0%	0.40 [-0.99, 1.79]
Lim. S	-0.4	1.64012195	49	-0.1	1.28062485	48	3.5%	-0.30 [-0.88, 0.28]
Liu	-1.65	3.10821492	134	-0.92	2.71576877	140	2.9%	-0.73 [-1.42, -0.04]
McCarrier	-0.37	1.78044938	41	0.11	1.98494332	36	2.2%	-0.48 [-1.33, 0.37]
McKay	-0.18	1.86034943	33	0.17	2.01734975	33	1.9%	-0.35 [-1.29, 0.59]
McMahon	-1.5	1.97230829	52	-1.3	1.7	52	2.8%	-0.20 [-0.91, 0.51]
Moatarri	-2.03	1.75504986	24	-0.6	2.2100905	24	1.5%	-1.43 [-2.56, -0.30]
Mulvaney 2010	0	2.61725047	34	0.3	1.7691806	18	1.3%	-0.30 [-1.50, 0.90]
Noh J.H	-1.5	2.33452351	20	-0.5	1.23693169	20	1.4%	-1.00 [-2.16, 0.16]
Quinn	-2	2.70185122	62	-0.7	2.47588368	56	1.9%	-1.30 [-2.23, -0.37]
Ralston	-0.9	1.53639188	39	0.2	1.53873324	35	2.8%	-1.10 [-1.80, -0.40]
Rossi	-0.4	1.13137085	67	-0.5	1.30384048	63	4.6%	0.10 [-0.32, 0.52]
Shea	-0.31	1.88661072	844	-0.06	2.2207206	821	6.4%	-0.25 [-0.45, -0.05]
Shetty	-0.1	1.83847763	78	-0.2	2.20227156	66	3.0%	0.10 [-0.57, 0.77]
Tildesley	-1.2	1.49586096	24	-0.1	1.84390889	23	1.9%	-1.10 [-2.06, -0.14]
Tjam	-0.2	1.41421356	37	0	1.41421356	20	2.5%	-0.20 [-0.97, 0.57]
Yoo	-0.5	1.20415946	57	0.2	1.3453624	54	4.2%	-0.70 [-1.18, -0.22]
Yoon	-1.32	1.88448932	25	0.81	1.50655236	26	1.9%	-2.13 [-3.07, -1.19]
Total (95% CI)			**2550**			**2427**	**100.0%**	**-0.45 [-0.60, -0.29]**

Heterogeneity: $Tau^2 = 0.08$; $Chi^2 = 169.88$, df = 33 ($P < 0.00001$); $I^2 = 81\%$

Test for overall effect: Z = 5.74 ($P < 0.00001$)



http://dx.doi.org/10.1016/j.diabres.2014.06.008

CONCLUSÃO

Os ***serviços online*** de redes sociais podem melhorar o ***controle de HbA1c*** em pacientes diabéticos, oferecendo uma abordagem inovadora e viável para melhorar o controle da glicemia, em relação ao ***gerenciamento médico padrão.***

http://dx.doi.org/10.1016/j.diabres.2014.06.008

TLM EM CDI

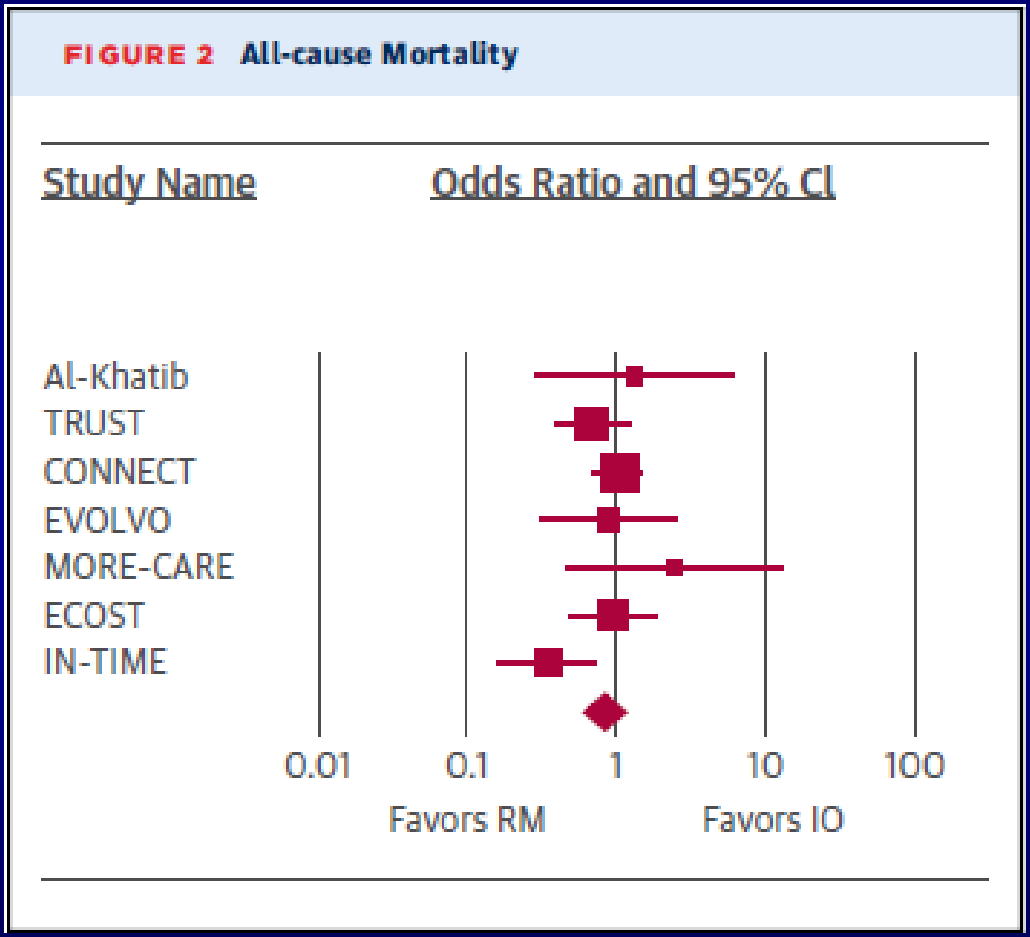
Remote Monitoring of Implantable Cardioverter-Defibrillators

A Systematic Review and Meta-Analysis of Clinical Outcomes

Nirmalatiban Parthiban,*† Adrian Esterman, PhD,‡ Rajiv Mahajan, MD, PhD,* Darragh J. Twomey, MBBS,* Rajeev K. Pathak, MBBS,* Dennis H. Lau, MBBS, PhD,* Kurt C. Roberts-Thomson, MBBS, PhD,* Glenn D. Young, MBBS,* Prashanthan Sanders, MBBS, PhD,* Anand N. Ganesan, MBBS PhD*

Parthiban et al. 2015:--- Clinical Impact of Remote Monitoring in ICD Patients. J A C C

TLM EM CDI



Parthiban et al. 2015:--- Clinical Impact of Remote Monitoring in ICD Patients. J A C C

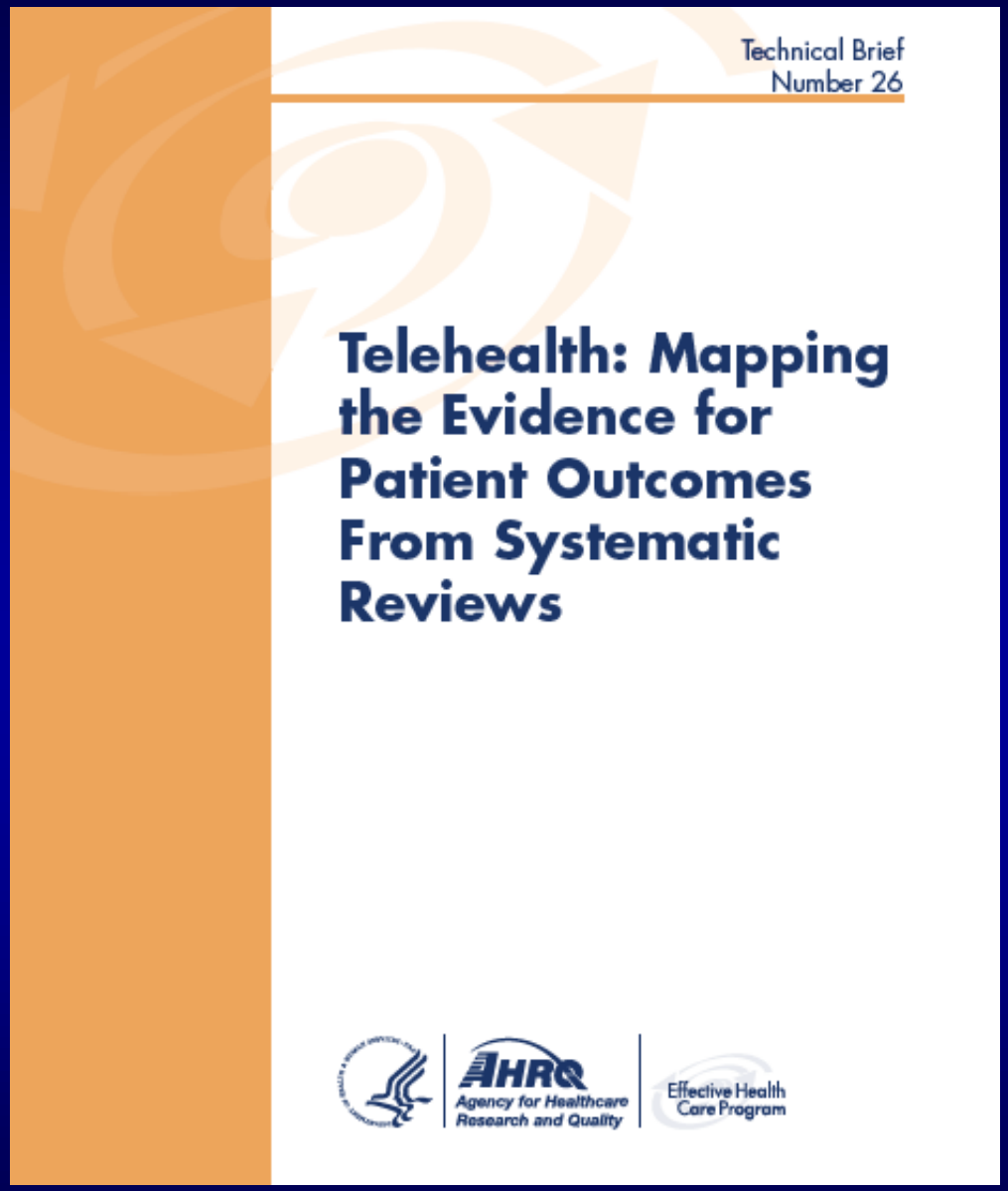
TLM EM CDI

O TLM de pacientes com ***cardiodesfibriladores implantáveis*** é uma tecnologia agora estabelecida e parte da prática clínica de rotina em muitos centros em todo o mundo.

Estes resultados sugerem ***fortes evidências*** da segurança do TLM.

Futuras investigações são necessárias para explorar ainda mais os principais benefícios clínicos do TLM.

Parthiban et al. 2015:-–- Clinical Impact of Remote Monitoring in ICD Patients. J A C C



Agency for Healthcare Research and Quality (AHRQ)

Agência de Pesquisa e Qualidade em Saúde

AHRQ Publication No. 16-EHC034-EF
June 2016

EVIDÊNCIAS

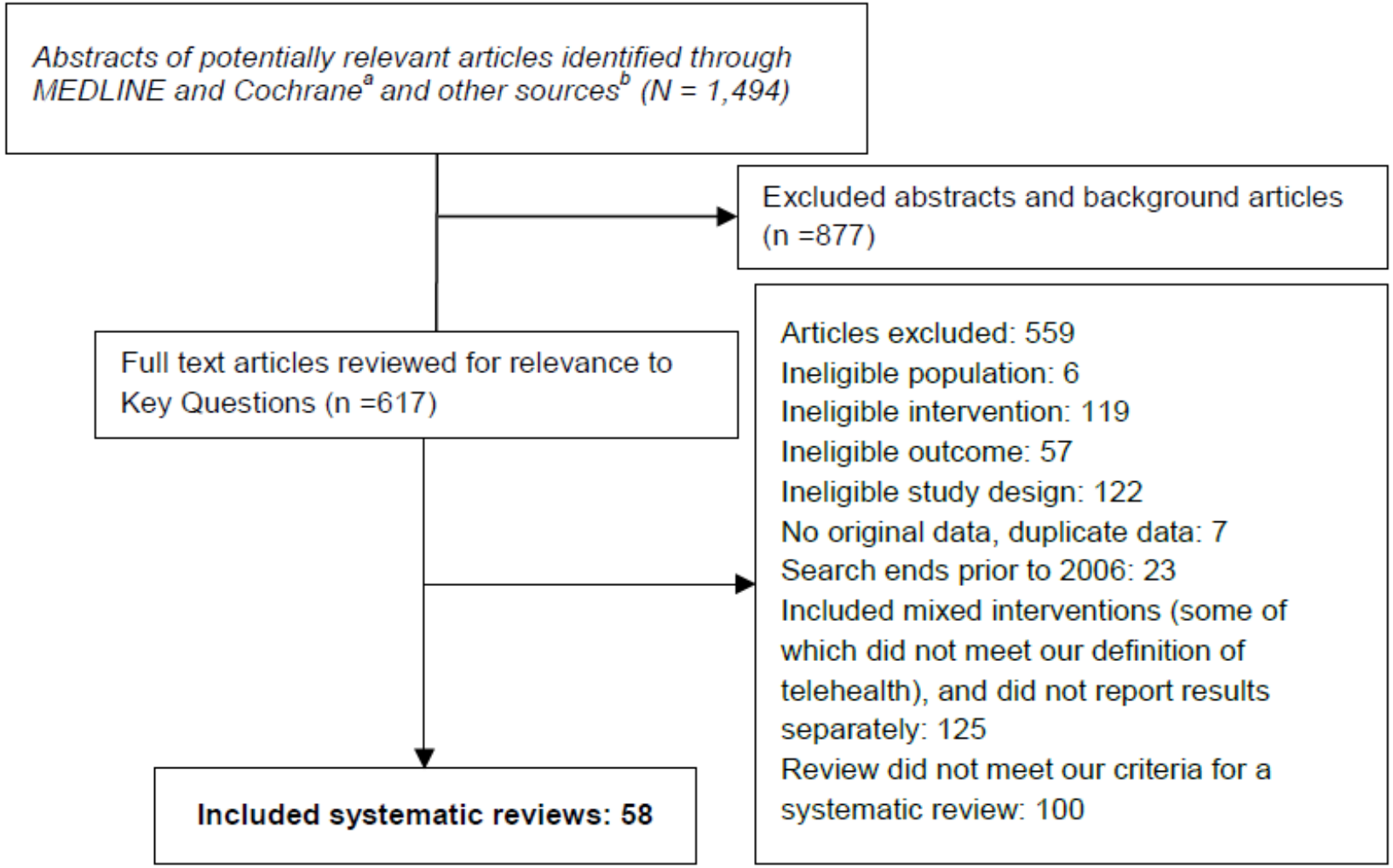
A Biblioteca Nacional de Medicina adicionou o termo Medical Subject Headings (MeSH) ***"Telemedicina",*** como sinônimo de ***Telehealth*** para sua lista de termos de indexação em 1993.

Em janeiro de 2016, havia mais de ***15.000 artigos e mais de 400 revisões sistemáticas*** que foram atribuídas a telemedicina.

AHRQ Publication No. 16-EHC034-EF
June 2016

RESULTADOS DA PESQUISA DA LITERATURA

Figure 2. Literature flow diagram: search results to included studies



REVISÕES SISTEMÁTICAS POR DATA DE PUBLICAÇÃO

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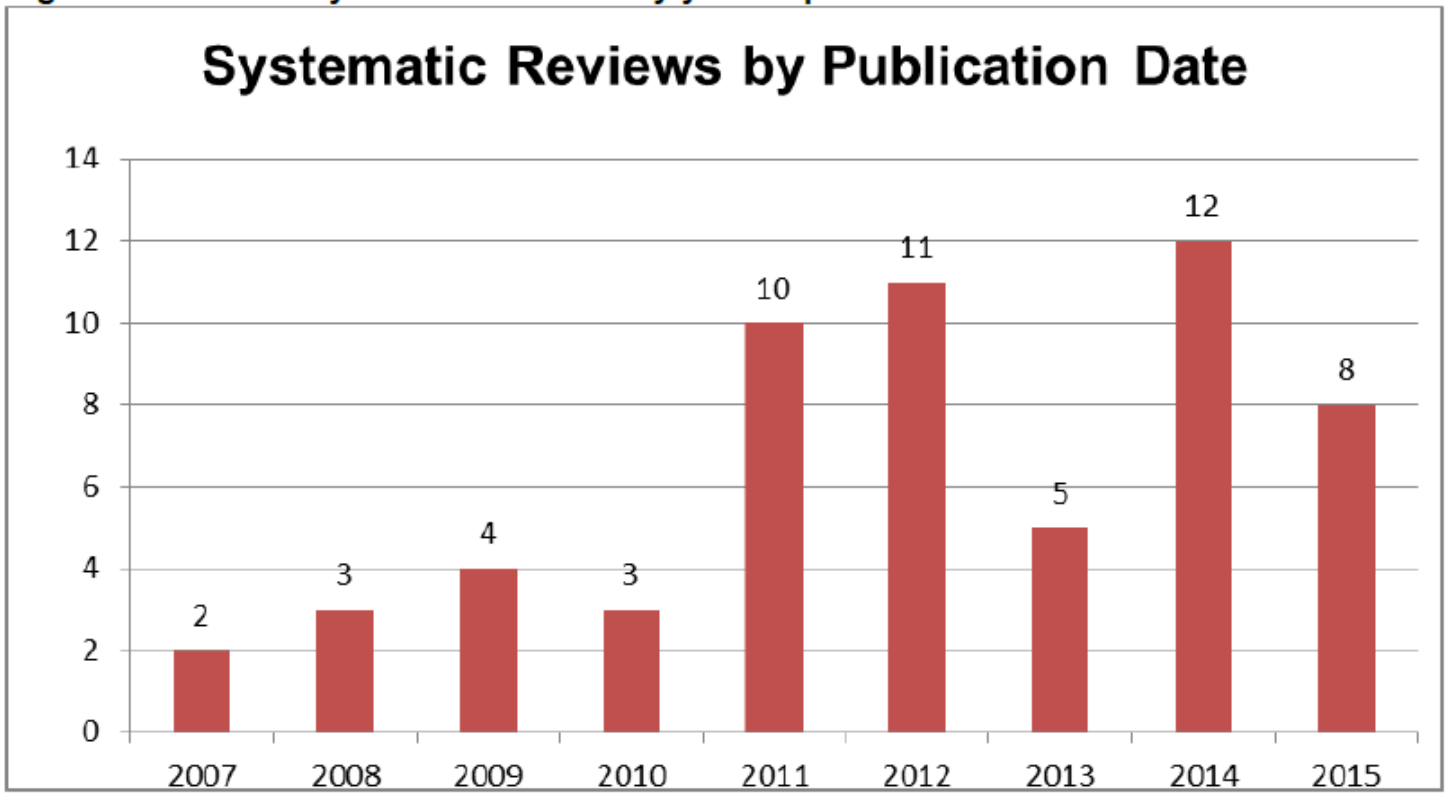
Figure 3. Included systematic reviews by year of publication



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DISTRIBUIÇÃO DO FOCO CLÍNICO DAS REVISÕES SISTEMÁTICAS

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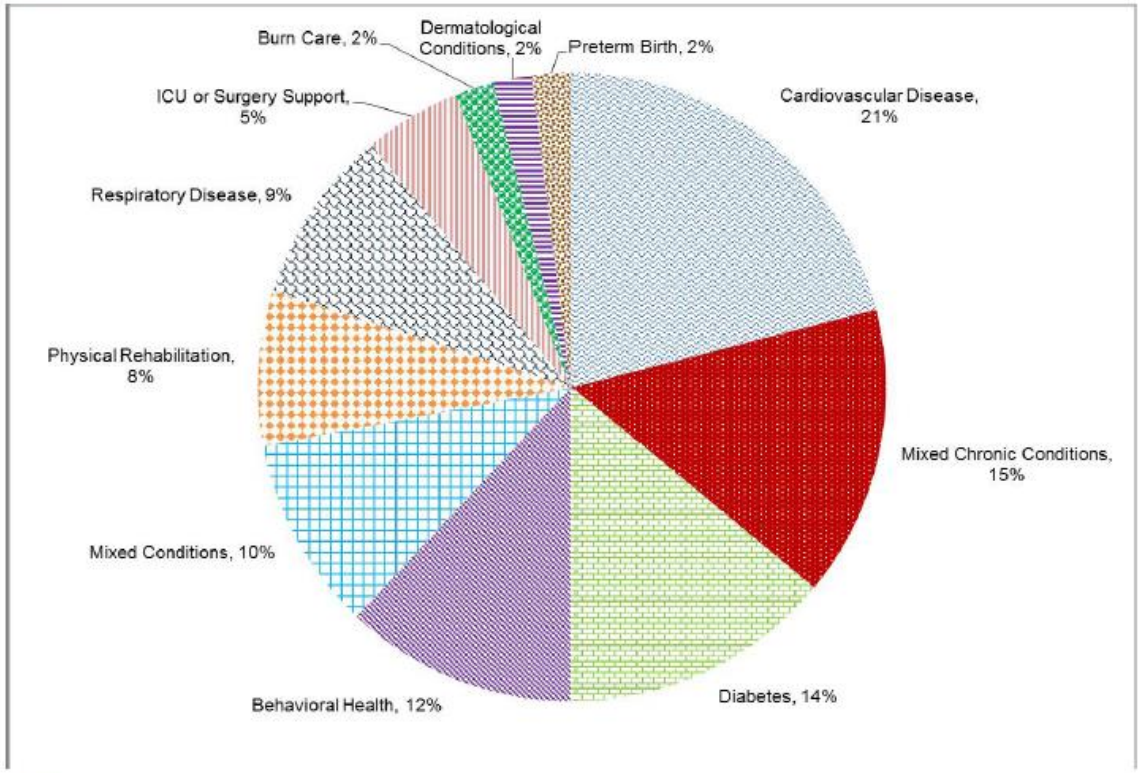
Figure 6. Distribution of clinical focus across included systematic reviews



ICU = intensive care unit

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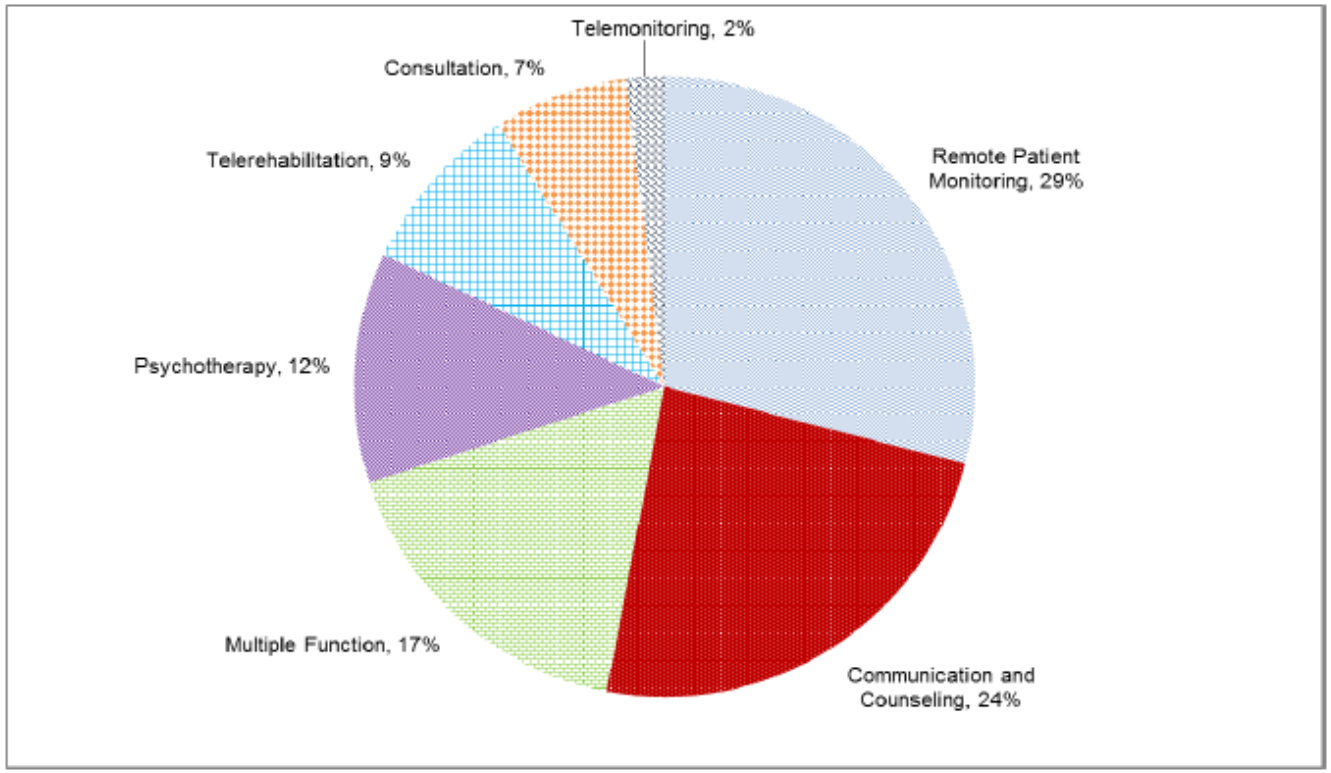
June 2016

DISTRIBUIÇÃO DE FUNÇÕES EM TELEMEDICINA INCLUIDAS NAS REVISÕES SISTEMÁTICAS

EVIDÊNCIAS

Figure 7. Distribution of telehealth function across included systematic reviews



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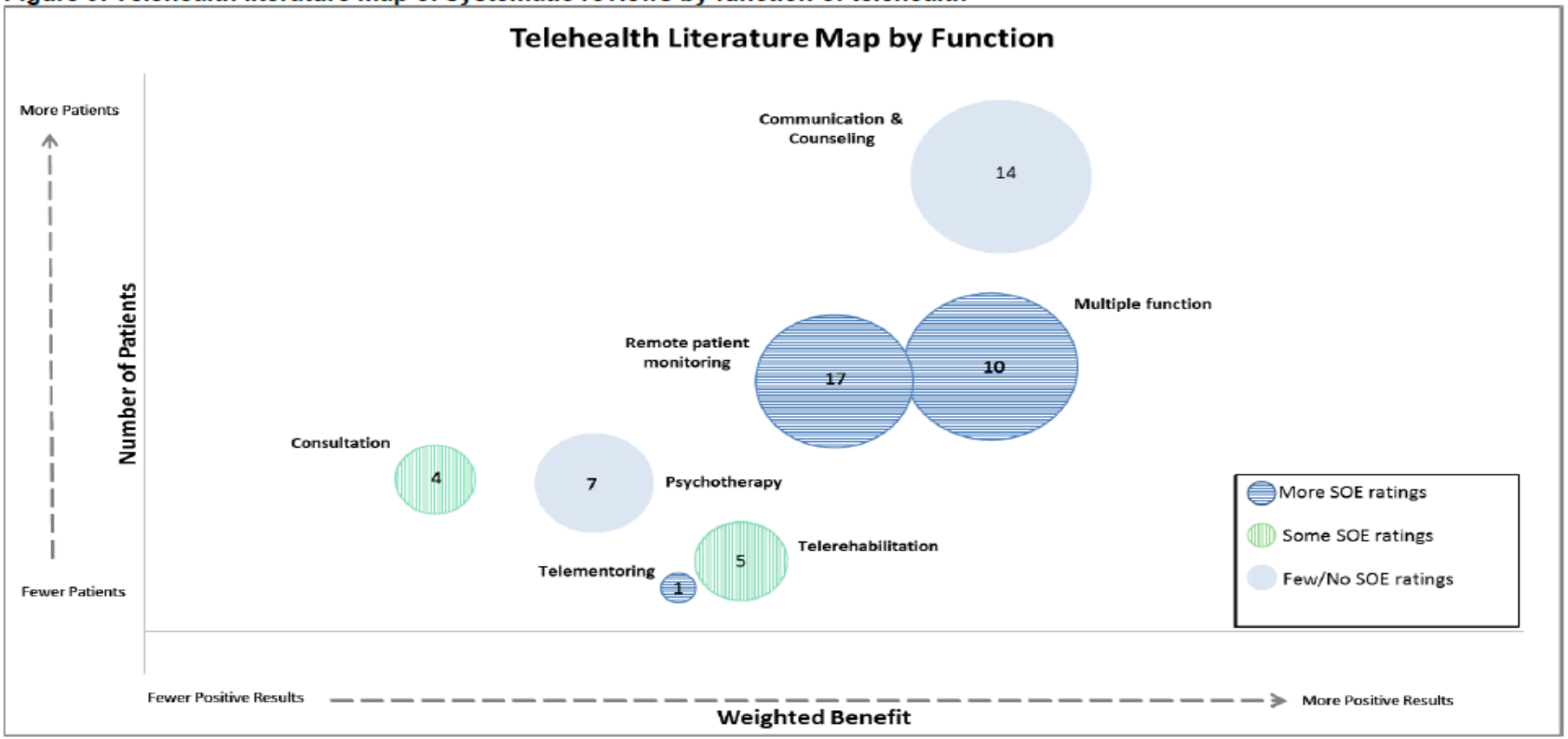
June 2016

MAPA DA LITERATURA DAS FUNÇÕES DA TELEMEDICINA

EVIDÊNCIAS

Figure 9. Telehealth literature map of systematic reviews by function of telehealth



a. Bubble size reflects the unduplicated number of individual studies included in the systematic reviews about that clinical focus. The number label on each bubble is the number of systematic reveiws. Smaller bubbles indicate fewer studies, larger bubbles indicate more studies. The color of the bubble represents how many of systematic reviews included strength of evidence assessment.

b. Weighted relative benefit is calculated by weighting the overall conclusion of each review by the number of studies in the review. Bubbles to the right indicate more positive findings while bubbles to the left represent findings that are unclear or found no benefit.

SOE=strength of evidence

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June 2016

RESULTADOS SELECIONADOS

REVISÕES SISTEMÁTICAS DA TELEMEDICINA EM CONDIÇÕES CRÔNICAS

Table 6. Selected results: Systematic reviews of telehealth for chronic conditions

Clinical Focus of SR	Author, Year Number of RCTs/Total Number of Included Studies Telehealth Function	Selected Results: Clinical Outcomes	Selected Results: Cost and/or Utilization
COPD	Kamei, 2013[58] 7/9 Remote Patient Monitoring	Mortality: No significant difference (5 trials) Fewer disease exacerbations Risk ratio from meta-analysis (2 trials)	Fewer hospitalizations Meta-analysis of 6 trials Fewer emergency department visits Meta-analysis of 4 trials
	McLean, 2011[a,66] 10/10 Remote Patient Monitoring	Higher quality of life (2 trials) Mortality: No significant difference 3 trials	Fewer hospitalizations Meta-analysis of 6 trials Fewer emergency department visits Meta-analysis of 3 trials
Heart Failure	Conway, 2014[81] 11/11 Remote Patient Monitoring	Lower reduced all-cause mortality (RR 0.62; 95% CI 0.50-0.077; p<0.0001)	Fewer HR-related hospitalizations (RR 0.75; 95% CI 0.63-0.91; p=0.003)
	Dang, 2008[45] 9/9 Remote Patient Monitoring	Lower mortality in 3 studies (not significant in 4; not reported in 2)	Fewer heart failure-related hospital admissions: 6 of 9 studies (1 trend toward increase; 2 not reported)
	Kotb, 2015[87] 30/30 Remote Patient Monitoring	Lower mortality (OR 0.53; 95% CI 0.36 - 0.080)	Fewer HR-related hospitalizations (OR 0.64; 95% CI 0.39-0.95)
	Seto, 2008[73] 4/10 Remote Patient Monitoring	None reported	Lower direct costs Reduced compared to usual care in all 9 studies that analyzed this (range 1.6% to 68.3%). Attributable to reductions in hospitalizations. Lower patient costs: 1 study reported reductions in travel costs
Secondary Prevention: Cardiovascular Disease	Widmer, 2015[95] 28/29 Communication and Counseling	Reduction in CVD outcomes, weight, body mass index and Framingham risk score. No improvement in blood pressure.	None reported
Implanted Cardioverter-Defibrillators	Parthiban, 2015[89] 9/9 Remote Patient Monitoring	Not significantly different from office followup overall Reduction in all-cause mortality in 3 studies with daily transmission verification (OR: 0.65; p=0.021) Reduction in inappropriate shock OR 0.55; p=0.002	Similar hospitalization to office followup

Clinical Focus of SR	Author, Year Number of RCTs/Total Number of Included Studies Telehealth Function	Selected Results: Clinical Outcomes	Selected Results: Cost and/or Utilization
Diabetes	Liang, 2010[63] 11/22 Communication and Counseling	Improvement in clinical outcomes, meta-analysis of 22 studies (diabetes)	None reported
	Saffari, 2014[91] 6/6 Remote Patient Monitoring	Improvement in HgA1c	None reported
	Toma, 2014[92] 34/34 Communication and Counseling	Improvement in clinical outcomes (HgA1c, BP, triglycerides and total cholesterol)	None reported
Mixed Chronic Conditions	Tran, 2008[76] 18/34 Remote Patient Monitoring	Improvement in clinical outcomes for diabetes and heart failure, meta-analysis of 12 and 5 trials (not seen in COPD—1 study reported higher mortality)	Fewer hospitalization and emergency visits More primary care and specialty visits
	de Jong, 2014[46] 15/15 Communication and Counseling	Improvement in clinical outcomes (5 trials) Improvement in symptoms (5 trials) Positive psychosocial outcomes (5 trials)	Physician visits: difference not significant 2 trials

BP=blood pressure, CI=confidence interval, COPD=chronic obstructive pulmonary disease, HgA1c=hemoglobin A1c, HR=hazard ratio, OR=odds ratio, RCTs=randomized controlled trials, RR=relative risk

[a] Two individual studies are repeated in these reviews

TELEMEDICINA CUSTOS E UTILIZAÇÃO

ACHADOS DAS REVISÕES SISTEMÁTICAS

Table 7. Telehealth cost and utilization: Findings from systematic reviews

Conclusion Category	Author, year Function/Clinical Area	Selected Findings
Positive Benefit= Cost Saving Or Utilization Reduction	Conway, 2014[81] Remote Patient Monitoring Cardiovascular Disease	• Reduction in heart failure hospitalizations RR 0.75; 95% CI 0.63 to 0.91; p=0.003 (3 studies)
	Kotb, 2015[87] Remote Patient Monitoring Cardiovascular Disease	• Reduction in health failure hospitalization ○ for telemonitoring: OR 0.64; 95% CI 0.39 to 0.95 (3 studies) ○ for telemonitoring that included transmission of ECG data OR 0.71; 95% CI 0.52 to 0.98 (3 studies)
	Seto, 2008[73] Remote Patient Monitoring Cardiovascular Disease	• Savings ranging from 1.6% to 68% to the health care system (9 studies) • 3.5% saving on patient travel (1 study)
	Kamel, 2013[58] Remote Patient Monitoring Respiratory Diseases	• Hospitalization risk lower with telehome monitoring; RR 0.81; 95% CI 0.69 to 0.95 for severe and very severe COPD (5 studies) ○ difference not significant for moderate disease (2 studies) • ED visits lower; RR 0.52; 95% CI 0.41 to 0.65 (4 studies)
Potential Benefit= Likely Savings Or Utilization Reduction (mixed results, but tending toward benefit)	Dang, 2009[45] Remote Patient Monitoring Cardiovascular Disease	• 20% to 63% reduction in health care utilization costs (3 studies) • 53% to 62% reduction in overall admissions (6 studies) ○ No difference in admissions (3 studies) • Significant reductions in ED visits (2 studies) ○ No difference (4 studies)
	Clarke, 2011[42] Remote Patient Monitoring Cardiovascular Disease	• Mixed finding about cost; 4 studies concluded costs were reduced; 2 found no significant difference • No cost-effectiveness or cost benefit • Significant reduction CHF admissions Meta-analysis RR 0.73; 95% CI 0.62 to 0.87 (6 studies) • No difference: All cause hospital admission (6 studies) • No difference: All cause ER (4 studies)
	Chaudhry, 2007[41] Remote Patient Monitoring Cardiovascular Disease	• Reduction in all cause hospitalizations (15%) (1 study) • Reduction in heart failure hospitalizations (40%) (1 study) • No difference in comparative studies of video and phone support (2 studies)
	Cruz, 2014 Remote Patient Monitoring/ Respiratory Diseases	• Reduction in hospitalizations (8 studies) • No difference in other utilization outcomes (number of hospitalizations, length of stay, emergency department visits • Trend toward reduced costs
	Jaana, 2009[55] Remote Patient Monitoring Respiratory Diseases	• Utilization-no consistent evidence (13 studies) • Mixed results from cost estimates or analysis (8 studies) ○ 2 showed ability to produce savings

TÓPICOS DE TELEMEDICINA

EVIDÊNCIAS POR CATEGORIAS

Table 8. Telehealth topics: Evidence categories

Category	Topic	Rationale
A	Remote patient monitoring for chronic conditions	Several systematic reviews available, consistent findings of benefit or potential benefit from most reviews
A	Communication and counseling for chronic conditions	Several systematic reviews available, consistent findings of benefit or potential benefit from most reviews.
A	Psychotherapy for behavioral health	Most systematic reviews report benefit or potential benefit; 1 review finds insufficient evidence for use in forensic and correctional psychiatry.
B	Consultation for various clinical reasons	Four reviews addressed telehealth for consultation; three of these did not come to a conclusion. The use of telehealth for consultation crosses clinical areas and may be a viable topic for future synthesis.
B	Applications of telehealth for acute/ICU care including remote patient monitoring and telementoring	The reviews identified for ICU/surgery and burn care combined with reviews in progress in critical care and postoperative care suggest a growing literature base on this important use of telehealth designed to expand access to high tech care in areas where access is limited.
B	Maternal and child health	Pregnancy and newborn routine health care monitoring is a frequent reason for health care visits and access can be limited in some areas. A preliminary search identified studies that cover multiple technologies and uses. A future systemative review may be able to organize the literature in a way that it would be useful for policy and decisionmaking.
C	Triage for urgent and primary care	While this has been proposed as a use for telehealth, most of the identified research was on telephone only interventions. It is unclear if telehealth is not used extensively for this purpose or if it has been used but has not been studied.
C	Applications in pediatrics (managing chronic serious conditions)	Healthcare for children with serious illnesses can be disruptive and impinge on normal life, activities and development. A small number of studies were identified across diverse conditions.
C	Applications relevant to the integration of mental and physical health	Although the integration of mental and physical health is an important goal in many health care reform efforts we did not identify overlap of these topics in telehealth research (e.g., telehealth to address depression in people with diabetes or to help patients struggling with addition to obtain preventive care).
C	Impact of teledermatology on patient outcomes	While there is substantial evidence related to diagnostic concordance, we were unable to identify more than a few studies that included clinical outcomes. While diagnostic concordance is important, research focused on outcomes appears to be needed to inform decisions about this use of the telehealth.
C	Impact on cost and utilization	The evidence on costs is limited and does not correspond to the importance of this issue. Additionally, studies are needed that evaluate telehealth under new payment models.

ICU=intensive care unit

PERSPECTIVAS

Muitas aplicações de ***telemonitoramento*** permitem que os pacientes forneçam ***mais dados*** aos provedores, de maneira ***mais rápida*** do que poderiam ser obtidos em ***visitas ambulatoriais***, ou permitir que os pacientes sejam monitorados em ***suas casas*** e não em hospitais.

AHRQ Publication No. 16-EHC034-EF
June 2016

PERSPECTIVAS

Novas ***diretrizes*** precisarão considerar o contexto da assistência, bem como o impacto dos serviços de ***telemonitoramento*** sobre o custo e a qualidade dos cuidados.

AHRQ Publication No. 16-EHC034-EF
June 2016

PERSPECTIVAS

A literatura de pesquisa sobre ***telemedicina*** é vasta e variada, constituída por centenas de ***revisões sistemáticas*** e milhares de ***estudos*** de uso em várias condições clínicas e funções de cuidados de saúde.

AHRQ Publication No. 16-EHC034-EF
June 2016

PERSPECTIVAS

Há evidências suficientes para apoiar a eficácia da telemedicina para usos específicos com alguns tipos de pacientes, incluindo :

- o ***Telemonitoramento*** de pacientes com condições crônicas;
- a ***Comunicação e aconselhamento*** de pacientes com condições crônicas;
- a ***Psicoterapia*** como parte da saúde comportamental.

AHRQ Publication No. 16-EHC034-EF
June 2016

“A IMAGINAÇÃO É MAIS IMPORTANTE DO QUE O CONHECIMENTO "

Albert Einstein

RUBENS DE FRAGA JÚNIOR

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