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# Objectives, Outcomes, Facilitators, and Barriers of Telemedicine Systems for Patients with Alzheimer's Disease and their Caregivers and Care Providers: A Systematic Review

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## Supplementary file1

**Table S1.** Characteristics of included studies in our study

Authors (publication year <sup>§</sup> )	Country*	Type of study	Healthcare provider setting	Patient setting	Sample population	Study duration	Intervention participants	Type of caregiver(s)	Technology intervention	Objectives	Outcomes	drivers	Barriers
Harvey <i>et al.</i> <sup>1</sup> (1998)	UK, Scotland, Ireland	Quantitative/ Cohort	Academic	Home	PwD and AD <65 and Cg (N=241)	Two years	P-P & Cg-P	Family members, general practitioner, and hospital doctors	Telephone-based	Evaluating telecare services	Cost effectiveness	Involving clinicians	N/M
Lee <i>et al.</i> <sup>2</sup> (2000)	South Korea	Quantitative/ RCT	Academic	Clinic	PwD and AD >65, Cg and Care personnel (N=140)	Two years	P-P & Cg-P	N/M	VC / VTM / CVT / VTC	Acceptability & Reliability	Cost effectiveness & Patient/provider satisfaction & Improving clinical outcomes & Improving behavioral symptoms patients	Reducing travel and saving time & Involving family & Training patients for self-administration & facilitating and supporting local services for the patient	Patients prefer face-to-face & Need internet & Software errors & Communication equipment errors & Expressing tense and frightened in the beginning
Mahoney <i>et al.</i> <sup>3</sup> (2003)	UK	Quantitative/ RCT	Academic	Home	Cg>21 (N=100, control group=51, intervention group=49)	6, 12 and 18 months	Cg-P	Sibling, Child, Spouses	Telephone-based	Ancillary tools to empower PwD or Cg	Reducing caregivers disruptive behaviors	Reducing caregiver burden	Privacy
Shores <i>et al.</i> <sup>4</sup> (2004)	USA	Quantitative/ Cohort	Academic	Home	PwD and AD>=60 Mean age=78.7 (N=85, n=18)	Five years	P-P	N/M	VC / VTM / CVT / VTC	Diagnosis	Patient/provider satisfaction & Estimating prevalence and type of dementia	Providing services in under-served rural areas & Reducing travel and saving time & Increasing motivation	Patients prefer face-to-face & Need internet & Privacy & Paying the cost to continue telemedicine services & Having difficulties related to audio echo & Having brief lag between auditory and visual images

Poon <i>et al.</i> <sup>5</sup> (2005)	China	Quantitative/ RCT	No academic	Clinic	AD (n=22)	Six weeks	P-P	N/M	VC / VTM / CVT / VTC	Feasibility & Comparing the effects of telecare and face-to-face therapy & Acceptability	Cost effectiveness & Patient/pro vider satisfaction	Reducin g travel and saving time	Patients prefer face- to-face
Vestal <i>et al.</i> <sup>6</sup> (2006)	USA	Quantitative/ RCT	No academic	Clinic	AD mean age=73.9 (N=15 n=10)	N/M	P-P	N/M	VC / VTM / CVT / VTC	Comparing the effects of telecare and face-to-face therapy	Patient/pro vider satisfaction	Providin g services in under- served rural areas & Reducin g travel and saving time	Need internet & Presence of background noise
Cullum <i>et al.</i> <sup>7</sup> (2006)	USA	Quantitative/ Cross sectional	Academic	Home*	MCI Mean age=73 (n=14) Moderate AD Mean age=73 (n=19)	Two months	P-P	N/M	VC / VTM / CVT / VTC	Feasibility	Cost effectiveness	N/M	Patients prefer face- to-face & Patients required assistance/car egiver
Loh <i>et al.</i> <sup>8</sup> (2007)	Australia	Quantitative/ RCT	Academic	Rural clinic	AD Mean age=79 (n=20) Physician (control group n=8, intervention group n=2)	N/M	P-P	N/M	VC / VTM / CVT / VTC	Diagnosis	N/M	Providin g services in under- served rural areas	Patients prefer face- to-face & Need internet & The telemedicine required that had good hearing and eyesight & Patients often have behavioral problems and they may not therefore be cooperative & Siting attentively in front of a television screen for at least an hour
Mundt <i>et al.</i> <sup>9</sup> (2007)	USA	Quantitative/ Cohort	Academic	Home	Individual>65 (n=36) MCI>65 (n=37) AD>65 (n=34)	4, 12 and 20 weeks	P-P	N/M	Telephone-based	Monitoring	Cost effectiveness & Improving patient care	Helping to research	N/M

Smith <i>et al.</i> <sup>10</sup> (2007)	USA	Quantitative/ Case control	Academic	Home	Contact total (N=4472)	six months	P-P	Social worker/care manager, Child	Other	Monitoring	Cost effectiveness & Decreasing concern/worry (lost or danger)/stress/anxiety / depression & Reducing medication delivery problems	Providing services in under- served rural areas & Training patients for self- administration & Involving clinicians	Patients required assistance/caregiver & Living in their own home or apartment & Turn off the monitor or camera by patient & Paying the cost to continue telemedicine services & Technical glitches & The equipment was a bit intrusive
					Phone contact (n=1855)								
					Video contact (n=2617)								
Wray <i>et al.</i> <sup>11</sup> (2010)	USA	Quantitative/ RCT	Academic	Home	PwD, AD and Cg (N=1649, n=158)	6-12 months	P-P & Cg-P	N/M	Telephone-based	Ancillary tools to empower PwD or Cg	Cost effectiveness	Training patients for self- administration & Reducing in the number of nursing home days	Patients required assistance/caregiver
Barton <i>et al.</i> <sup>12</sup> (2011)	USA	Quantitative/ Cross sectional	Academic	Rural clinic	Moderate AD Mean age=79.1 (n=19)	N/M	P-P	N/M	VC / VTM / CVT / VTC	Diagnosis	Cost effectiveness & Patient/pro vider satisfaction	Providing services in under- served rural areas & Reducing travel and saving time & Training caregivers	Patients prefer face- to-face & Security (HIPAA) & Patients required assistance/caregiver & Needing to room in clinic
					MCI Mean age=79.1 (n=2)								
					Individual Mean age=79.1 (n=1)								
Oderda <i>et al.</i> <sup>13</sup> (2011)	USA	Qualitative/ Description	Academic	Home	Clinical pharmacists (n=2)	One year	P-P & Cg-P	N/M	Telephone-based	Developing	Cost effectiveness & Improving patient care	Reducing caregiver burden	N/M
PwD and AD													

Weiner <i>et al.</i> <sup>14</sup> (2011)	USA	Quantitative/ Non randomized trial	No academic	Clinic	PwD and AD (n=85)	5 years	P-P	N/M	VC / VTM / CVT / VTC	Diagnosis & Management	Cost effectiveness & Increasing quality of Life	Providing services in under-served rural areas & Involving family	Patients prefer face-to-face & Needing to room in clinic & Some patients did not understand that they had seen a doctor
Wilz <i>et al.</i> <sup>15</sup> (2011)	Germany	Quantitative/ RCT	Academic	Home	Cg (N=343, n=229)	2 years	Cg-P	N/M	Telephone-based	Effectiveness	N/M	Involving family & Increasing motivation	Patients required assistance/caregiver
Azad <i>et al.</i> <sup>16</sup> (2012)	Canada	Quantitative/ Cross sectional	No academic	Rural clinic	MCI or mild dementia and AD >=65 (n=99)	4 years	P-P	N/M	VC / VTM / CVT / VTC	Follow-up	Patient/provider satisfaction & Improving patient care	Providing services in under-served rural areas & Reducing travel and saving time & Involving family & Increasing safety and risk management (e.g. prevent falls in night)	Patients prefer face-to-face & Patients required assistance/caregiver & Privacy & Needing to room in clinic & Technical glitches & Software errors & Increasing anxiety
Chou <i>et al.</i> <sup>17</sup> (2012)	Taiwan	Qualitative/ Description	Academic	Home	Cg Mean age=82.6 (n=30)	6 month	Cg-P	Child, Spouses	Other	Ancillary tools to empower PwD or Cg & Evaluating the user friendliness, usefulness of telecare	Decreasing concern/worry (lost or danger)/stresses/anxiety / depression & Improving patient care &	Reducing caregiver burden & Increasing safety and risk management (e.g.	Unfamiliar with technology

											Reducing uncertainty	prevent falls in night) & Usefulness, Ease of use	
Glueckauf <i>et al.</i> <sup>18</sup> (2012)	USA	Quantitative/ RCT	Academic	Home	Cg Mean age=60.89 (N=14, n=10, control group =5, intervention group =5)	6 months	Cg-P	N/M	Telephone-based	Comparing the effects of telecare and face-to-face therapy	N/M	N/M	Patients prefer face-to-face
Martin-Khan <i>et al.</i> <sup>19</sup> (2012)	Australia	Quantitative/ Cohort	Academic	Clinic	PwD and AD >=50 (N=270, n=205)  Physician (n=2)	2 years	P-P	N/M	VC / VTM / CVT / VTC	Validity a scale	Cost effectiveness & Patient/provider satisfaction	Providing services in under-served rural areas & Reducing travel and saving time & Helping to diagnosis of dementia	Patients prefer face-to-face & Need internet
Mitseva <i>et al.</i> <sup>20</sup> (2012)	Greece, Finland, Denmark, and UK	Quantitative/ Cross sectional	Academic	Home <sup>&amp;</sup>	MCI or mild dementia (n=80)  Cg (N=7, control group = 45, intervention group = 26)	15 months	P-P & Cg-P	Child, Spouses	Other	Ancillary tools to empower PwD or Cg	Patient/provider satisfaction & Increasing quality of Life & Improving patient care & Decreasing concern/worry (lost or danger)/stresses/anxiety / depression	Reducing travel and saving time & Increasing safety and risk management (e.g. prevent falls in night), Accepting the technology and the services	Patients prefer face-to-face & Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Need internet & Privacy
Parikh <i>et al.</i> <sup>21</sup>	USA	Quantitative/	Academic	Room	Individual	10-20 years	P-P	N/M	VC / VTM / CVT /	Acceptability	Patient/pro	N/M	Patients

(2013)		RCT			(n=21) AD (n=7)  MCI (n=12)				VTC		vider satisfactio n		prefer face- to-face & Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Privacy & The telemedicine required that had good hearing and eyesight
Martin <i>et al.</i> <sup>22</sup> (2013)	UK	Qualitative/ Description	Academic	Home&	PwD and AD (n=8)	3 months	P-P	N/M	Other	Ancillary tools to empower PwD or Cg	Improving patient care	Increasi ng safety and risk manage ment (e.g. prevent falls in night)	Patients prefer face- to-face & Living in their own home or apartment
Tchalla <i>et al.</i> <sup>23</sup> (2013)	France	Quantitative/ RCT	No academic	Home	Mild and moderate AD >65 (N=96, intervention group=49, control group= 47)	One year	P-P	N/M	Telephone-based	Ancillary tools to empower PwD or Cg	N/M	Increasi ng safety and risk manage ment (e.g. prevent falls in night)	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home
Williams <i>et al.</i> <sup>24</sup> (2013)	USA	Quantitative/ RCT	Academic	Home&	Cg (N= N/M)	3 months	Cg-P	N/M	VC / VTM / CVT / VTC	Monitoring	Increasing quality of Life	Providin g services in under- served rural areas	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Need internet & Security (HIPAA) & Privacy
Harrell <i>et al.</i> <sup>25</sup> (2014)	USA	Quantitative/ Cross sectional	No academic	Clinic	PwD, AD and Cg Mean age=74.88 (N=100,	2 weeks	P-P	N/M	VC / VTM / CVT / VTC	Feasibility	N/M	Reducin g travel and saving time	Need to hardware (e.g. computer, laptop,

					n=31)									microphone, webcam, sensor and ...) at home
Jelcic <i>et al.</i> <sup>26</sup> (2014)	Italy	Quantitative/ RCT	No academic	Clinic	AD (N=38, n=27)	3 months	P-P	N/M	VC / VTM / CVT / VTC	Feasibility & Efficacy	Cost effectiveness	Providing services in under-served rural areas & Increasing safety and risk management (e.g. prevent falls in night)	Patients prefer face-to-face	
Cullum <i>et al.</i> <sup>27</sup> (2014)	USA	Quantitative/ Case-control	Academic	Clinic	PwD and AD Mean age=68.5 (n=202)	N/M	P-P	N/M	VC / VTM / CVT / VTC	Comparing the effects of telecare and face-to-face therapy	N/M	Providing services in under-served rural areas & Accepting the technology and the services	Patients prefer face-to-face & Need internet & Needing to room in clinic & The telemedicine required that had good hearing and eyesight	
O'Connell <i>et al.</i> <sup>28</sup> (2014)	Canada	Qualitative/ Description	No academic	Home	Cg (N=10, n=7)	18 months	Cg-P	Spouses	VC / VTM / CVT / VTC	Developing	N/M	Providing services in under-served rural areas & Reducing travel and saving time	Patients prefer face-to-face & Need internet & Security (HIPAA) & Technical problems related to the virtual nature of the connection & Presence of background noise	
Catic <i>et al.</i> <sup>29</sup> (2014)	USA	Quantitative/ Cross sectional	No academic	Long-term care sites	AD Mean age=82 (N=47, n=39)	Median= 18 months	P-P	N/M	VC / VTM / CVT / VTC	Presenting the experiences and outcomes of designing and	Cost effectiveness & Improving clinical outcomes	N/M	Need to hardware (e.g. computer, laptop, microphone,	



										implementin g an telecare	& Decreasing hospitaliza tion and mortality		webcam, sensor and ...) at home & Need internet & Security (HIPAA) & Satisfying medical licensing requirements in some states that do not allow licensed physicians from other states to consult with their physicians
Schaller <i>et al.</i> <sup>30</sup> (2015)	Germany	Quantitative/ Cross sectional	Academic	Home	Cg (n=42)	3 months	Cg-P	Child, Spouses	Other	Ancillary tools to empower PwD or Cg	Cost effectivene ss & Decreasing concern/w orry (lost or danger)/str ess/anxiety / depression	Reducin g travel and saving time & Reducin g caregive r burden & Increasi ng motivati on	Privacy
Cheong <i>et al.</i> <sup>31</sup> (2015)	South Korea	Quantitative/ RCT	Academic	Rural clinic	PwD and AD <=70 (N=442, n=427, control group =259, intervention group =168)	Five year	P-P	N/M	VC / VTM / CVT / VTC	Effectiveness	Patient/pro vider satisfactio n	Accepti ng the technolo gy and the services & Decreasi ng the disease progress ion in dementi a patients in rural areas	Patients prefer face- to-face & Security (HIPAA)
Hattink <i>et al.</i> <sup>32</sup> (2015)	The Netherlands, Sweden, Italy, Malta, Romania, and	Quantitative/ RCT	Academic	Home	Cg (N=142, In the Netherlands=85 and in UK=57)	For 2 to 4 months	Cg-P	N/M	Other	Evaluating the user friendliness, usefulness of telecare	N/M	Usefuln ess & User friendlin ess	Need to hardware (e.g. computer, laptop,

	UK												microphone, webcam, sensor and ...) at home & Need internet & No having computer at home
Kim <i>et al.</i> <sup>33</sup> (2015)	South Korea	Quantitative/ RCT	Academic	Clinic	PwD and AD (N=188, control group =90, intervention group =98)	Five years	P-P	N/M	VC / VTM / CVT / VTC	Effectiveness	N/M	Providing services in under-served rural areas	Patients prefer face-to-face & Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home
Pakrasi <i>et al.</i> <sup>34</sup> (2015)	UK and USA	Qualitative/ Description	No academic	Home	PwD and AD in UK (N=125 n=26) Family in UK and USA (n=109)	Three years	P-P	N/M	VC / VTM / CVT / VTC	Ancillary tools to empower PwD or Cg	Cost effectiveness & Increasing quality of Life & Reducing Stigma	Providing services in under-served rural areas	N/M
Bowes <i>et al.</i> <sup>35</sup> (2016)	The Faroe Islands, Greenland, Sweden and Scotland	Mix method/ Cross sectional	Academic	Home	PwD and AD >60 and Cg (n=78)	N/M	P-P & Cg-P	N/M	Other	Developing & Evaluating telecare services	N/M	Reducing travel and saving time, facilitating and supporting local services for the patient	Living in their own home or apartment
Burton <i>et al.</i> <sup>36</sup> (2016)	Canada	Quantitative/ Cross sectional	Academic	Room <sup>†</sup>	MCI (n=5) AD (n=8) AD / VaD (n=2)	3 years	P-P & Cg-P	N/M	VC / VTM / CVT / VTC	Developing	Patient/provider satisfaction	Increasing motivation	N/M
Lindauer <i>et al.</i> <sup>37</sup> (2017)	USA	Quantitative/ RCT	Academic	Home	PwD and AD Mean age=71.6 (n=33) Cg Mean age=65.3 (n=33)	2 weeks	P-P & Cg-P	N/M	VC / VTM / CVT / VTC	Feasibility & Reliability	Cost effectiveness	N/M	Patients prefer face-to-face & Need to hardware (e.g. computer, laptop, microphone, webcam,

													sensor and ... ) at home & Need internet & Security (HIPAA) & The telemedicine required that had good hearing and eyesight & Technical problems related to the virtual nature of the connection
Mavandadi <i>et al.</i> <sup>38</sup> (2017)	USA	Quantitative/ RCT	Academic	Home	Cg Mean age=64 (n=440)	3 and 6 months	Cg-P	N/M	Telephone-based	Ancillary tools to empower PwD or Cg	N/M	Providing services in underserved rural areas, Reducing caregiver burden	N/M
Tremont <i>et al.</i> <sup>39</sup> (2017)	Island	Quantitative/ RCT	Academic	Home	Cg Mean age=62.7 (N=250 control group =133, intervention group =117)	>6 months	Cg-P	N/M	Telephone-based	Effectiveness	Cost effectiveness & Decreasing concern/worry (lost or danger)/stress/anxiety / depression & Decreasing hospitalization and mortality	N/M	N/M
Burton <i>et al.</i> <sup>40</sup> (2018)	Canada	Quantitative/ RCT	Academic	Room <sup>#</sup>	SCI (n=4) AD (n=1)	> 8 weeks	Cg-P	N/M	VC / VTM / CVT / VTC	Feasibility & Acceptability	Increasing quality of Life	N/M	N/M
Dang <i>et al.</i> <sup>41</sup> (2018)	USA	Quantitative/ Cross	No academic	Clinic room	PwD and AD (n=94)	19 months	P-P & Cg-P	N/M	VC / VTM / CVT / VTC	Feasibility & Acceptability	Patient/provider	Providing	N/M

		sectional			Cg (n=41)						satisfaction	services in under-served rural areas & Helping to diagnosis of dementia	
Powers <i>et al.</i> <sup>42</sup> (2018)	USA	Quantitative/ Cross sectional	No academic	Outpatient clinic	PwD and AD (n=36)	3 years	P-P & Cg-P	Family members, Spouses	VC / VTM / CVT / VTC	Ancillary tools to empower PwD or Cg	Patient/provider satisfaction	Providing services in under-served rural areas & Reducing travel and saving time	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Security (HIPAA) & Increasing stress in caregiver
Lindauer <i>et al.</i> <sup>43</sup> (2018)	USA	Mix method/ Cross sectional	Academic	Home	Cg (n=20)	2 months	Cg-P	N/M	VC / VTM / CVT / VTC	Feasibility & Efficacy & Examining cost of implementing a telecare	Cost effectiveness	Involving family & Training caregivers	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Need internet & Unfamiliar with technology & Increasing anxiety & Increasing stress in caregiver & Increasing Stigma
Carotenuto <i>et al.</i> <sup>44</sup> (2018)	Italy	Quantitative/ RCT	Academic	Hospital room	AD>50 (n=28)	24 months	P-P & Cg-P	Child, Spouses	VC / VTM / CVT / VTC	Examining and assess a scale	N/M	Reducing travel and saving time	Patients prefer face-to-face & Need to hardware (e.g. computer, laptop, microphone, webcam,

													sensor and ... ) at home & Need internet & Security (HIPAA) & Patients required assistance/caregiver & The telemedicine required that had good hearing and eyesight
Chang <i>et al.</i> <sup>45</sup> (2018)	USA	Quantitative/Observational	Academic	Rural clinic	PwD and AD (n=199)	One year	P-P & Cg-P	N/M	VC / VTM / CVT / VTC	Ancillary tools to empower PwD or Cg	Increasing quality of Life & Reducing medication delivery problems	N/M	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ... ) at home & Security (HIPAA) & Needing to room in clinic
Griffith <i>et al.</i> <sup>46</sup> (2018)	USA	Quantitative/Before-after	Academic	Home	Cg (N=64 n=57)	6 weeks	Cg-P	Spouses	VC / VTM / CVT / VTC	Feasibility & Efficacy	Decreasing concern/worry (lost or danger)/stress/anxiety / depression	Providing services in underserved rural areas & Reducing caregiver burden & Training caregivers	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ... ) at home & Need internet & Privacy
Wilz <i>et al.</i> <sup>47</sup> (2018)	Germany	Quantitative/RCT	Academic	Home	Cg Mean age =64.10 (N=273, intervention group= 139, control group = 134)	6 months	Cg-P	Child, Spouses	Telephone-based	Effectiveness	Patient/provider satisfaction & Decreasing concern/worry (lost or danger)/stress/anxiety /	Involving family	Patients prefer face-to-face

											depression & Improving behavioral symptoms patient		
Wadsworth <i>et al.</i> <sup>48</sup> (2018)	USA	Quantitative/ RCT	Academic	N/M	PwD and AD (N=197, control group= 119, intervention group= 78)	7 and 14 days	P-P	N/M	VC / VTM / CVT / VTC	Ancillary tools to empower PwD or Cg	N/M	N/M	Patients prefer face-to-face & Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Need internet
Töpfer <i>et al.</i> <sup>49</sup> (2018)	Germany	Quantitative/ RCT	Academic	Home	Cg mean age =64.19 (N=273, intervention group = 139, control group = 134)	One year	Cg-P	N/M	Telephone-based	Ancillary tools to empower PwD or Cg	N/M	Involving family & Increasing motivation	N/M
Lindauer <i>et al.</i> <sup>50</sup> (2019)	USA	Quantitative/ Before-after	Academic	Home	Cg (N=20)	2 months	Cg-P	Sibling, Spouses	VC / VTM / CVT / VTC	Efficacy	Cost effectiveness & Decreasing concern/worry (lost or danger)/stress/anxiety / depression	Reducing travel and saving time & Involving family & Reducing caregiver burden	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Need internet & Security (HIPAA)
Gustafson <i>et al.</i> <sup>51</sup> (2019)	USA	Quantitative/ RCT	Academic	Home	Cg (N=31)	6 months	Cg-P	Child, Spouses	Other	Effectiveness	Decreasing concern/worry (lost or danger)/stress/anxiety / depression & Increasing quality of Life	Involving family & Reducing caregiver burden	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Turn off the monitor or camera by patient

Banbury <i>et al.</i> <sup>52</sup> (2019)	Australia	Quantitative/ RCT	Academic	Home*	Cg Mean age=63 (N=69)	6 weeks	Cg-P	Child, Spouses	VC / VTM / CVT / VTC	Developing & Evaluating telecare services	N/M	N/M	Need internet & Needing to room in clinic
Williams <i>et al.</i> <sup>53</sup> (2019)	USA	Quantitative/ RCT	Academic	Home&	Cg (N=84, intervention group =43, control group =41)	3 months	Cg-P	Child, Spouses	VC / VTM / CVT / VTC	Ancillary tools to empower PwD or Cg	Patient/pro vider satisfactio n & Decreasing concern/w orry (lost or danger)/str ess/anxiety / depression	Involvin g family & Reducin g caregive r burden	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Need internet & Living in their own home or apartment
Thomas <i>et al.</i> <sup>54</sup> (2019)	USA	Qualitative/ Case study	Academic	Home	Cg (N= N/M)	12-18 months	Cg-P	Spouses	VC / VTM / CVT / VTC	Comparing the effects of telecare and face-to-face therapy	Decreasing concern/w orry (lost or danger)/str ess/anxiety / depression	Reducin g caregive r burden	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home
Mavandadi <i>et al.</i> <sup>55</sup> (2019)	USA	Quantitative/ RCT	No academic	Home	Cg mean age =83.1 (N=158, n=107)	>18 months	Cg-P	Spouses	Telephone-based	Examining and assess a scale	Patient/pro vider satisfactio n & Increasing quality of Life	N/M	Patients required assistance/car egiver & Living in their own home or apartment
Moo <i>et al.</i> <sup>56</sup> (2020)	USA	Quantitative/ Non randomized trials	Academic	Home	Family mean age for patient=82 (N=222 control group =184, intervention group =38)	One year	Cg-P	Social worker/care manager, Child, Spouses	VC / VTM / CVT / VTC	Comparing the effects of telecare and face-to-face therapy	Patient/pro vider satisfactio n & Decreasing concern/w orry (lost or danger)/str ess/anxiety / depression & Improving patient care	Reducin g travel and saving time	Need to hardware (e.g. computer, laptop, microphone, webcam, sensor and ...) at home & Need internet & Security (HIPAA) & Patients required assistance/car egiver

Laver <i>et al.</i> <sup>57</sup> (2020)	Australia	Quantitative/ RCT	Academic	Home	PwD and AD (N=63)	4 months	P-P	N/M	VC / VTM / CVT / VTC	Comparing the effects of telehealth and face-to- face therapy	N/M	Reducin g travel	N/M
Williams <i>et al.</i> <sup>58</sup> (2021)	USA	Mix method/ RCT	Academic	Home	PwD and AD (N= 71)	3 months	Cg-P	Child, Spouses	VC / VTM / CVT / VTC	Satisfaction, utilization, and feasibility of a telehealth intervention	Feasibility & Improving patient care	Involvin g family &	Privacy
					Cg (N= 83)								
Howard <i>et al.</i> <sup>59</sup> (2021)	UK	Quantitative/ RCT	Academic	Home	PwD and AD (N= 200)	3 months	P-P	N/M	Other	The effectiveness and cost- effectiveness of assistive technology and telecare	Cost effectivene ss & effectivene ss	Involvin g clinician s	N/M
Di Lorito <i>et al.</i> <sup>60</sup> (2021)	UK	Qualitative/ Case study	Academic	Home	PwD and AD>=65 (N=5)	4 months	Cg-P P-P	Child, Spouses	VC / VTM / CVT / VTC	Tele- Rehabilitatio n for PwD during the COVID-19 pandemic	Time efficiency of sessions & enhancing participant s' motivation & caregivers' dementia awareness & therapists' creativity	Involvin g clinician s & Involvin g family	Patients required assistance/car egiver
					Cg (N= 10)								
<p>the United Kingdom (UK), the United States of America (USA), Mild Cognitive Impairment (MCI), People with Dementia (PwD), Caregiver (Cg), Alzheimer Disease (AD), Vascular Dementia (VaD), Subjective Cognitive Impairment (SCI), Patient-Physician (P-P), Caregiver- Physician (Cg-P), Video Conferencing (VC), Video Telemedicine (VTM), Clinical Video Telehealth (CVT), Video Telecommunication (VTM), and Not Mentioned (N/M)</p> <p><sup>5</sup> The year of publication of the articles in the table is from old to new</p> <p><sup>*</sup>Virtual room</p> <p><sup>#</sup>Room in university</p> <p><sup>&amp;</sup>Smart or intelligence or expert home</p>													

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