

Best Evidence Summaries of Topics in Mental Healthcare

BEST *in* **MH** *clinical question-answering service*

Question

In adults with moderate to severe cognitive impairment how effective is the use of crockery in primary colours in improving food and fluid intake? Which colours have been found to be most effective?

Clarification of question using PICO structure

Patients: Adults with moderate to severe cognitive impairment

Intervention: Crockery in primary colours

Comparator: Non primary coloured crockery

Outcome: Improving food and fluid intake

Clinical and research implications

No definite clinical implications can be made from the available evidence. The authors of one observational study suggested that clinicians and caregivers should consider implementing high contrast red or blue tableware to increase food and liquid intake in patients with Alzheimer's disease. Although the results of this study were promising, the small numbers of participants, and the short duration of the study, suggests that more research in this area may be needed to confirm these results.

What does the evidence say?

Number of included studies/reviews (number of participants)

One observational study met the inclusion criteria for this BEST summary (Dunne et al. 2004).

Main Findings

The authors conducted evaluations at two different time periods. In the first study, data were collected over three consecutive 10-day periods in 9 participants. For the first 10 days (baseline), white cups and stainless-steel flatware were used. For the next 10 days, high contrast red plates, cups and red flatware were used. For the last 10 days, the plates, cups and flatware from the baseline condition were used. There were no variations in staff, room setting, lighting, daily routine, or health status. Mean percent increase was 24.6% for food and 83.7% for liquid for high-contrast intervention vs. baseline.

A second study one year later was conducted with five of the original and 4 new participants. In this study there was a significant increase in food and liquid intake during high-contrast intervention, but not low-contrast interventions (i.e. low-contrast blue or red) compared to white tableware. The mean percent increase in food intake was 25.1% for high-contrast blue, 0% for low-contrast red, and 5.2% for low-contrast blue. The mean percent increase in liquid intake was 29.8% for high-contrast blue, 0.4% for low-contrast red, and 0.3 % for low-contrast blue.

Authors Conclusions

The authors concluded that simple environmental manipulations, such as contrast enhancement, can significantly increase food and liquid intake in frail demented patients with Alzheimer's disease.

Reliability of conclusions/Strength of evidence

Due to some methodological limitations of this study (i.e. small sample sizes, short-term intervention, observational study design), the reliability of the conclusion is uncertain.

What do guidelines say?

No relevant UK guidelines were found.

Date question received: 30/01/2013

Date searches conducted: 04/02/2013

Date answer completed: 08/02/2013

References

1. Dunne TE, Nearing SA, Cipolloni PB, Cronin-Golomb A. Visual contrast enhances food and liquid intake in advanced Alzheimer's disease. *Clinical Nutrition* 2004;23:533-8.

Results







Primary Studies

Author (year)	Inclusion criteria	Number of participants	Summary of results	Risk of bias
Dunne et al (2004)	<p><i>Participants</i> – participants were diagnosed with probable Alzheimer’s dementia, and were on average 82.7 years of age. Cognition was measured through the MMSE with an average score of 2.9 (indicating severe global impairment). All patients resided in long-term care units. To be included in the study, the participants had to be able to eat independently.</p> <p><i>Intervention</i> - High contrast red plates, red cups, and red flatware were used at meal times. In a one year replication of this study, high contract red ware and blue ware were compared to low intensity red ware and blue ware, and white ware.</p> <p><i>Comparison</i> - white plates, white cups, and white flatware were used at meal times.</p> <p><i>Outcome</i> – Percentage food and liquid intake (the amount of food and liquid consumed over the 10-day period were added and then divided by the total amount of food and liquid</p>	N = 9	<p>Mean percent increase was 24.6% for food and 83.7% for liquid for high-contrast intervention (red) vs. baseline (white). A multivariate analysis was conducted to assess the within-subject effects of meal type (lunch and supper) and condition (baseline, intervention, and post-intervention). This analysis revealed a significance difference for condition (p=0.00), but not for meal type, p=0.08).</p> <p>Eight of the nine participants demonstrated at least a 10% increase in food and liquid intake at intervention relative to baseline and post-intervention. The authors stated that the poorer ingestors appeared to benefit the most.</p> <p>At a one year study replication, there was a significant increase in food and liquid intake during high-contrast intervention, but not low-contrast interventions (i.e. low-contrast blue or red) compared to baseline. The mean percent increase in food intake was 25.1% for high-contrast blue, 0% for low-contrast red, and 5.2% for low-contrast blue. The mean percent increase in liquid intake was 29.8% for high-contrast blue, 0.4% for low-contrast red, and 0.3 % for low-contrast blue.</p> <p>Greater food ingestion at intervention was seen in 6 of the 9 participants, and greater liquid ingestion was seen in 5 of the</p>	High


	<p>served, respectively).</p> <p><i>Duration</i> - Data were collected over three consecutive 10-day periods. For the first 10 days (baseline), white cups and stainless-steel flatware were used. For the next 10 days, high contrast red plates, cups and red flatware were used. For the last 10 days, the plates, cups and flatware from the baseline condition were used. There were no variations in staff, room setting, lighting, daily routine, or health status. A second study one year later was conducted with five of the original and 4 new participants.</p>		<p>9 participants for the high-contrast blue condition.</p>	
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Risk of Bias: Non-RCTs

Primary Study

Study	RISK OF BIAS					
	Aims and objectives clearly stated?	Is the study design appropriate?	Adequate description of groups?	Objective and reliable measures?	Power calculation/ justification of numbers?	Appropriate statistical analysis?
Dunne 2004						

 Low Risk

 High Risk

 Unclear Risk

Search Details

Source	Search Strategy	Number of hits	Relevant evidence identified
<i>SRs and Guidelines</i>			
NICE	Dementia	79	0
DARE	(cognit* ADJ2 impair*) IN DARE 207 Delete 2 (cognit* ADJ2 disorder*) IN DARE 173 Delete 3 (*cognit* ADJ2 disorder*) IN DARE 175 Delete 4 (dement*) IN DARE 438 Delete 5 (colour*) IN DARE 77 Delete 6 (color*) IN DARE 637 Delete 7 MeSH DESCRIPTOR Alzheimer Disease EXPLODE ALL TREES 220 Delete 8 MeSH DESCRIPTOR Dementia EXPLODE ALL TREES 393 Delete 9 MeSH DESCRIPTOR Delirium, Dementia, Amnestic, Cognitive Disorders EXPLODE ALL TREES 533 Delete 10 MeSH DESCRIPTOR Dementia EXPLODE ALL TREES 393 Delete 11 MeSH DESCRIPTOR Dementia, Multi-Infarct EXPLODE ALL TREES 0 Delete 12 MeSH DESCRIPTOR Dementia, Vascular EXPLODE ALL TREES 16 Delete 13 MeSH DESCRIPTOR Frontotemporal Dementia EXPLODE ALL TREES 0 Delete 14 MeSH DESCRIPTOR Frontotemporal Dementia EXPLODE ALL TREES 0 Delete 15 MeSH DESCRIPTOR Lewy Body Disease EXPLODE ALL TREES 2 Delete	69	0

	<p>16 MeSH DESCRIPTOR Frontotemporal Lobar Degeneration EXPLODE ALL TREES 0 Delete</p> <p>17 #1 OR #2 OR #3 OR #4 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 888 Delete</p> <p>18 (visual ADJ3 aid*) IN DARE 4 Delete</p> <p>19 (vision or visual* or sight*) IN DARE 1756 Delete</p> <p>20 (sensor* ADJ3 aid*) IN DARE 1 Delete</p> <p>21 #5 OR #6 OR #18 OR #19 OR #20 2393 Delete</p> <p>22 #17 AND #21</p>		
Primary studies			
CENTRAL	<p>1 (cognit* ADJ2 impair*) IN DARE 207 Delete 2 (cognit* ADJ2 disorder*) IN DARE 173</p> <p>3 (*cognit* ADJ2 disorder*) IN DARE 175</p> <p>4 (dement*) IN DARE 438</p> <p>5 (colour*) IN DARE 77</p> <p>6 (color*) IN DARE 637</p> <p>7 MeSH DESCRIPTOR Alzheimer Disease EXPLODE ALL TREES 220</p> <p>8 MeSH DESCRIPTOR Dementia EXPLODE ALL TREES 393</p> <p>9 MeSH DESCRIPTOR Delirium, Dementia, Amnestic, Cognitive Disorders EXPLODE ALL TREES 533</p> <p>10 MeSH DESCRIPTOR Dementia EXPLODE ALL TREES</p>		1

393		
11 MeSH DESCRIPTOR Dementia, Multi-Infarct EXPLODE ALL TREES 0		
12 MeSH DESCRIPTOR Dementia, Vascular EXPLODE ALL TREES 16		
13 MeSH DESCRIPTOR Frontotemporal Dementia EXPLODE ALL TREES 0		
14 MeSH DESCRIPTOR Frontotemporal Dementia EXPLODE ALL TREES 0		
15 MeSH DESCRIPTOR Lewy Body Disease EXPLODE ALL TREES 2		
16 MeSH DESCRIPTOR Frontotemporal Lobar Degeneration EXPLODE ALL TREES 0		
17 #1 OR #2 OR #3 OR #4 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 888		
18 (visual ADJ3 aid*) IN DARE 4		
19 (vision or visual* or sight*) IN DARE 1756		
20 (sensor* ADJ3 aid*) IN DARE 1		
21 #5 OR #6 OR #18 OR #19 OR #20 2393		
22 #17 AND #21		

<p>PsycINFO</p>	<p>Search History:</p> <ol style="list-style-type: none"> 1. PsycINFO; "severe cognitive impairment".ti,ab; 352 results. 2. PsycINFO; COGNITIVE IMPAIRMENT/; 18820 results. 3. PsycINFO; exp DEMENTIA/; 46832 results. 4. PsycINFO; ALZHEIMER'S DISEASE/; 28192 results. 5. PsycINFO; (severe adj3 "cognitive impairment").ti,ab; 437 results. 6. PsycINFO; (moderate adj3 "cognitive impairment").ti,ab; 209 results. 7. PsycINFO; 1 OR 2 OR 3 OR 4 OR 5 OR 6; 60457 results. 8. PsycINFO; "primary coloured crockery".ti,ab; 0 results. 9. PsycINFO; (plates OR mugs OR bowls OR crockery).ti,ab; 1275 results. 10. PsycINFO; (red OR green OR blue).ti,ab; 20692 results. 11. PsycINFO; (colour* OR color*).ti,ab; 42886 results. 12. PsycINFO; "special crockery".ti,ab; 0 results. 13. PsycINFO; (bright ADJ col*).ti,ab; 108 results. 14. PsycINFO; "contrast sensitivity".ti,ab; 1490 results. 15. PsycINFO; COLOR/ OR COLOR PERCEPTION/; 10363 results. 16. PsycINFO; "primary colo*".ti,ab; 111 results. 17. PsycINFO; VISUAL CONTRAST/; 2148 results. 18. PsycINFO; 9 OR 10 OR 11 OR 13 OR 14 OR 15 OR 16 OR 17; 62955 results. 19. PsycINFO; 7 AND 18; 733 results. 20. PsycINFO; FOOD INTAKE/ OR EATING BEHAVIOR [+NT]/; 16696 results. 21. PsycINFO; FLUID INTAKE/ OR DRINKING BEHAVIOR [+NT]/; 2148 results. 22. PsycINFO; (food OR fluid adj3 intake).ti,ab; 8296 results. 23. PsycINFO; 20 OR 21 OR 22; 21791 results. 24. PsycINFO; 19 AND 23; 1 results. 25. PsycINFO; exp INGESTION/; 16790 results. 26. PsycINFO; 19 AND 25; 1 results. 27. PsycINFO; 9 OR 10 OR 16; 21956 results. 28. PsycINFO; 7 AND 27; 291 results. 	<p>1</p>	
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	<p>29. PsycINFO; 7 AND 14; 36 results.</p> <p>30. PsycINFO; 25 AND 29; 0 results.</p> <p>31. PsycINFO; 23 OR 25; 25454 results.</p> <p>32. PsycINFO; 28 AND 31; 1 results.</p>		
EMBASE	<p>33. EMBASE; "severe cognitive impairment".ti,ab; 840 results.</p> <p>34. EMBASE; COGNITIVE IMPAIRMENT/; 84138 results.</p> <p>35. EMBASE; exp DEMENTIA/; 203331 results.</p> <p>36. EMBASE; ALZHEIMER'S DISEASE/; 111380 results.</p> <p>37. EMBASE; (severe adj3 "cognitive impairment").ti,ab; 1075 results.</p> <p>38. EMBASE; (moderate adj3 "cognitive impairment").ti,ab; 490 results.</p> <p>39. EMBASE; 33 OR 34 OR 35 OR 36 OR 37 OR 38; 264068 results.</p> <p>40. EMBASE; "primary coloured crockery".ti,ab; 0 results.</p> <p>41. EMBASE; (plates OR mugs OR bowls OR crockery).ti,ab; 45670 results.</p> <p>42. EMBASE; (red OR green OR blue).ti,ab; 359397 results.</p> <p>43. EMBASE; (colour* OR color*).ti,ab; 266171 results.</p> <p>44. EMBASE; "special crockery".ti,ab; 0 results.</p> <p>45. EMBASE; (bright ADJ col*).ti,ab; 174 results.</p> <p>46. EMBASE; "contrast sensitivity".ti,ab; 5300 results.</p> <p>47. EMBASE; COLOR/ OR COLOR PERCEPTION/; 40398 results.</p> <p>48. EMBASE; "primary colo*".ti,ab; 3622 results.</p> <p>49. EMBASE; VISUAL CONTRAST/; 74 results.</p> <p>50. EMBASE; 41 OR 42 OR 43 OR 45 OR 46 OR 47 OR 48 OR 49; 659040 results.</p> <p>51. EMBASE; 39 AND 50; 4097 results.</p> <p>52. EMBASE; FOOD INTAKE/ OR EATING BEHAVIOR [+NT]/; 112524 results.</p> <p>53. EMBASE; FLUID INTAKE/ OR DRINKING BEHAVIOR [+NT]/; 46234 results.</p> <p>54. EMBASE; (food OR fluid adj3 intake).ti,ab; 43702 results.</p> <p>55. EMBASE; 52 OR 53 OR 54; 170519 results.</p> <p>56. EMBASE; 51 AND 55; 47 results.</p> <p>57. EMBASE; exp INGESTION/; 9479 results.</p>	38	

	<p>58. EMBASE; 51 AND 57; 4 results.</p> <p>59. EMBASE; 41 OR 42 OR 48; 406222 results.</p> <p>60. EMBASE; 39 AND 59; 2525 results.</p> <p>61. EMBASE; 39 AND 46; 90 results.</p> <p>62. EMBASE; 57 AND 61; 0 results.</p> <p>63. EMBASE; 55 OR 57; 179044 results.</p> <p>64. EMBASE; 60 AND 63; 38 results.</p>		
CINAHL	<p>33. CINAHL; "severe cognitive impairment".ti,ab; 187 results.</p> <p>34. CINAHL; COGNITIVE IMPAIRMENT/; 0 results.</p> <p>35. CINAHL; exp DEMENTIA/; 30707 results.</p> <p>36. CINAHL; ALZHEIMER'S DISEASE/; 13415 results.</p> <p>37. CINAHL; (severe adj3 "cognitive impairment").ti,ab; 243 results.</p> <p>38. CINAHL; (moderate adj3 "cognitive impairment").ti,ab; 131 results.</p> <p>39. CINAHL; 33 OR 34 OR 35 OR 36 OR 37 OR 38; 30916 results.</p> <p>40. CINAHL; "primary coloured crockery".ti,ab; 0 results.</p> <p>41. CINAHL; (plates OR mugs OR bowls OR crockery).ti,ab; 1511 results.</p> <p>42. CINAHL; (red OR green OR blue).ti,ab; 13225 results.</p> <p>43. CINAHL; (colour* OR color*).ti,ab; 15025 results.</p> <p>44. CINAHL; "special crockery".ti,ab; 0 results.</p> <p>45. CINAHL; (bright ADJ col*).ti,ab; 23 results.</p> <p>46. CINAHL; "contrast sensitivity".ti,ab; 185 results.</p> <p>47. CINAHL; COLOR/ OR COLOR PERCEPTION/; 1907 results.</p> <p>48. CINAHL; "primary colo*".ti,ab; 76 results.</p> <p>49. CINAHL; VISUAL CONTRAST/; 0 results.</p> <p>50. CINAHL; 41 OR 42 OR 43 OR 45 OR 46 OR 47 OR 48</p>	3	

	<p>OR 49; 30212 results.</p> <p>51. CINAHL; 39 AND 50; 177 results.</p> <p>52. CINAHL; FOOD INTAKE/ OR EATING BEHAVIOR [+NT]/; 3383 results.</p> <p>53. CINAHL; FLUID INTAKE/ OR DRINKING BEHAVIOR [+NT]/; 1158 results.</p> <p>54. CINAHL; (food OR fluid adj3 intake).ti,ab; 25762 results.</p> <p>55. CINAHL; 52 OR 53 OR 54; 28839 results.</p> <p>56. CINAHL; 51 AND 55; 4 results.</p> <p>57. CINAHL; exp INGESTION/; 0 results.</p> <p>58. CINAHL; 51 AND 57; 0 results.</p> <p>59. CINAHL; 41 OR 42 OR 48; 14770 results.</p> <p>60. CINAHL; 39 AND 59; 80 results.</p> <p>61. CINAHL; 39 AND 46; 6 results.</p> <p>62. CINAHL; 57 AND 61; 0 results.</p> <p>63. CINAHL; 55 OR 57; 28839 results.</p> <p>64. CINAHL; 60 AND 63; 3 results.</p>		
MEDLINE	<p>33. MEDLINE; "severe cognitive impairment".ti,ab; 613 results.</p> <p>34. MEDLINE; COGNITIVE IMPAIRMENT/; 0 results.</p> <p>35. MEDLINE; exp DEMENTIA/; 107917 results.</p> <p>36. MEDLINE; ALZHEIMER'S DISEASE/; 0 results.</p> <p>37. MEDLINE; (severe adj3 "cognitive impairment").ti,ab; 761 results.</p> <p>38. MEDLINE; (moderate adj3 "cognitive impairment").ti,ab; 330 results.</p> <p>39. MEDLINE; 33 OR 34 OR 35 OR 36 OR 37 OR 38; 108583 results.</p> <p>40. MEDLINE; "primary coloured crockery".ti,ab; 0</p>	5	

	<p>results.</p> <p>41. MEDLINE; (plates OR mugs OR bowls OR crockery).ti,ab; 39874 results.</p> <p>42. MEDLINE; (red OR green OR blue).ti,ab; 317296 results.</p> <p>43. MEDLINE; (colour* OR color*).ti,ab; 216974 results.</p> <p>44. MEDLINE; "special crockery".ti,ab; 0 results.</p> <p>45. MEDLINE; (bright ADJ col*).ti,ab; 162 results.</p> <p>46. MEDLINE; "contrast sensitivity".ti,ab; 4665 results.</p> <p>47. MEDLINE; COLOR/ OR COLOR PERCEPTION/; 30417 results.</p> <p>48. MEDLINE; "primary colo*".ti,ab; 2988 results.</p> <p>49. MEDLINE; VISUAL CONTRAST/; 7560 results.</p> <p>50. MEDLINE; 41 OR 42 OR 43 OR 45 OR 46 OR 47 OR 48 OR 49; 569074 results.</p> <p>51. MEDLINE; 39 AND 50; 1369 results.</p> <p>52. MEDLINE; FOOD INTAKE/ OR EATING BEHAVIOR [+NT]/; 71642 results.</p> <p>53. MEDLINE; FLUID INTAKE/ OR DRINKING BEHAVIOR [+NT]/; 5670 results.</p> <p>54. MEDLINE; (food OR fluid adj3 intake).ti,ab; 36222 results.</p> <p>55. MEDLINE; 52 OR 53 OR 54; 97164 results.</p> <p>56. MEDLINE; 51 AND 55; 5 results.</p> <p>57. MEDLINE; exp INGESTION/; 54937 results.</p> <p>58. MEDLINE; 51 AND 57; 3 results.</p> <p>59. MEDLINE; 41 OR 42 OR 48; 358166 results.</p> <p>60. MEDLINE; 39 AND 59; 913 results.</p> <p>61. MEDLINE; 39 AND 46; 45 results.</p> <p>62. MEDLINE; 57 AND 61; 1 results.</p>		
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	63. MEDLINE; 55 OR 57; 111477 results. 64. MEDLINE; 60 AND 63; 5 results.		
Summary	NA	NA	

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