

Appendix A. The search strategy in Web of Science and Medline.

1. WEB OF SCIENCE (Results: 208)

Title: (Light therapy OR Light treatment OR Light exposure OR Bright light OR "Effect of light") AND (elder* OR old* OR dement* OR Alzheimer OR nursing home OR day care)

Timespan: 1900-2019

Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, IC

2. MEDLINE (Results: 152)

Title: (Light therapy OR Light treatment OR Light exposure OR Bright light OR "Effect of light") AND (elder* OR old* OR dement* OR Alzheimer OR nursing home OR day care)

Timespan: 1950-2019

Indexes= MEDLINE.

Appendix B. Reasons for the exclusion of full-text articles based on the application of the inclusion criteria (n=65).

Citation	Reason for exclusion
A. RESULTS FROM THE WEB OF SCIENCE	
1. Alparslan GB, Özkaraman A, Özbabalik D, Colak E. The effect of light on daily activities and sleep in patients with Alzheimer's Disease. <i>J Turk Sleep Med.</i> 2019;3:59-64.	Absence of measurement criteria to determine cognitive impairment
2. Missotten P, Farag L, Delye S, Muller A, Grotz C, Adam S. Place des therapies lumiere aupres des personnes agees souffrant de pathologie dementielle: etat des lieux et perspectives futures. (Role of "light therapy" among older adults with dementia: an overview and future perspectives). <i>Geriatric et psychologie neuropsychiatrie du vieillissement.</i> 2019;17(1):83-91.	No original research
3. Scheuermaier K, Lee JH, Duffy JF. Phase Shifts to a Moderate Intensity Light Exposure in Older Adults: A Preliminary Report. <i>J Biol Rhythms.</i> 2019;34(1):98-104.	Persons younger than 65 years or with a mean age less than 65 years old
4. Scheuermaier K, Münch M, Ronda JM, Duffy JF. Improved cognitive morning performance in healthy older adults following blue-enriched light exposure on the previous evening. <i>Behav Brain Res.</i> 2018;348:267-275.	Patients with no cognitive impairment
5. Nioi A, Roe J, Gow A, McNair D, Aspinall P. Seasonal Differences in Light Exposure and the Associations With	Not using light therapy

- Health and Well-Being in Older Adults: An Exploratory Study. *Herd-Health Env Res.* 2017;10(5):64-79.
6. Wu M, Sung H, Lee W, Smith GD. The effects of light therapy on depression and sleep disruption in older adults in a long-term care facility. *Int J Nurs Pract.* 2015;21(5):653-659. Patients with no cognitive impairment
 7. Obayashi K, Saeki K, Kurumatani N. Light exposure at night is associated with subclinical carotid atherosclerosis in the general elderly population: The HEIJO-KYO cohort. *Chronobiol Int.* 2015;32(3):310-317. Not designed to study the effect of light therapy on behavioral and psychological symptoms of dementia or cognitive impairment
 8. Obayashi K, Saeki K, Tone N, Iwamoto J, Miyata K, Ikada Y, et al. Lower melatonin secretion in older females: Gender differences independent of light exposure profiles. *J Epidemiol.* 2015;25(1):38-43. Not designed to study the effect of light therapy on behavioral and psychological symptoms of dementia or cognitive impairment
 9. Obayashi K, Saeki K, Kurumatani N. Association between light exposure at night and insomnia in the general elderly population: The HEIJO-KYO cohort. *Chronobiol Int.* 2014;31(9):976-982. Patients with no cognitive impairment
 10. Obayashi K, Saeki K, Iwamoto J, Ikada Y, Kurumatani N. Association between light exposure at night and nighttime blood pressure in the elderly independent of Not using light therapy

nocturnal urinary melatonin excretion. *Chronobiol Int.* 2014;31(6):779-786.

- | | | |
|-----|---|--|
| 11. | Obayashi K, Saeki K, Iwamoto J, Okamoto N, Tomioka K, Nezu S, et al. Effect of exposure to evening light on sleep initiation in the elderly: A longitudinal analysis for repeated measurements in home settings. <i>Chronobiol Int.</i> 2014;31(4):461-467. | Not using light therapy |
| 12. | Obayashi K, Saeki K, Iwamoto J, Ikada Y, Kurumatani N. Independent associations of exposure to evening light and nocturnal urinary melatonin excretion with diabetes in the elderly. <i>Chronobiol Int.</i> 2014;31(3):394-400. | Not designed to study the effect of light therapy on behavioral and psychological symptoms of dementia or cognitive impairment |
| 13. | van der Ploeg ES, O'Connor DW. Methodological challenges in studies of bright light therapy to treat sleep disorders in nursing home residents with dementia. <i>Psychiatry Clin Neurosci.</i> 2014;68(11):777-784. | No original research |
| 14. | Chong MS, Tan KT, Tay L, Wong YM, Ancoli-Israel S. Bright light therapy as part of a multicomponent management program improves sleep and functional outcomes in delirious older hospitalized adults. <i>Clin Interv Aging.</i> 2013;8:565-572. | Patients with delirium |
| 15. | Kretschmer V, Schmidt K, Griefahn B. Bright-light effects on cognitive performance in elderly persons working simulated night shifts: Psychological well-being as a | Persons younger than 65 years or with a mean age less than 65 years old |

mediator? *Int Arch Occup Environ Health*.

2013;86(8):901-914.

- | | |
|--|--|
| 16. Akyar I, Akdemir N. The effect of light therapy on the sleep quality of the elderly: An intervention study. <i>Aust J Adv Nurs</i> . 2013;31(2):31-38. | Patients with no cognitive impairment |
| 17. Obayashi K, Saeki K, Iwamoto J, Ikada Y, Kurumatani N. Exposure to light at night and risk of depression in the elderly. <i>J Affect Disord</i> . 2013;151(1):331-336. | Not using light therapy |
| 18. Obayashi K, Saeki K, Iwamoto J, Okamoto N, Tomioka K, Nezu S, et al. Exposure to light at night, nocturnal urinary melatonin excretion, and obesity/dyslipidemia in the elderly: A cross-sectional analysis of the HEIJO-KYO study. <i>J Clin Endocrinol Metab</i> . 2013;98(1):337-344. | Not designed to study the effect of light therapy on behavioral and psychological symptoms of dementia or cognitive impairment |
| 19. Kretschmer V, Schmidt K-, Griefahn B. Bright light effects on working memory, sustained attention and concentration of elderly night shift workers. <i>Light Res Technol</i> . 2012;44(3):316-333. | Persons younger than 65 years or with a mean age less than 65 years old |
| 20. Figueiro MG, Hamner R, Higgins P, Hornick T, Rea MS. Field measurements of light exposures and circadian disruption in two populations of older adults. <i>J Alzheimers Dis</i> . 2012;31(4):711-715. | Not using light therapy |
| 21. Kretschmer V, Griefahn B, Schmidt K. Bright light and night work: Effects on selective and divided attention in | Persons younger than 65 years or with a mean age |

- elderly persons. *Light Res Technol.* 2011;43(4):473-486. less than 65 years old
22. Lieveerse R, van Someren EJW, Nielen MMA, Uitdehaag BMJ, Smit JH, Hoogendijk WJG. Bright light treatment in elderly patients with nonseasonal major depressive disorder A randomized placebo-controlled trial. *Arch Gen Psychiatry.* 2011;68(1):61-70. Patients with no cognitive impairment
23. Muench M, Scheuermaier KD, Zhang R, Dunne SP, Guzik AM, Silva EJ, et al. Effects on subjective and objective alertness and sleep in response to evening light exposure in older subjects. *Behav Brain Res.* 2011;224(2):272-278. Persons younger than 65 years or with a mean age less than 65 years old
24. Scheuermaier K, Laffan AM, Duffy JF. Light exposure patterns in healthy older and young adults. *J Biol Rhythms.* 2010;25(2):113-122. Patients with no cognitive impairment
25. van Hoof J, Aarts MPJ, Rense CG, Schoutens AMC. Ambient bright light in dementia: Effects on behaviour and circadian rhythmicity. *Build Environ.* 2009;44(1):146-155. Absence of measurement criteria to determine cognitive impairment
26. Staples VSL, Archer SN, Arber S, Skene DJ. Daily light exposure profiles in older non-resident extreme morning and evening types. *J Sleep Res.* 2009;18(4):466-471. Not using light therapy
27. Figueiro MG, Bierman A, Bullough JD, Rea MS. A personal light-treatment device for improving sleep quality in the elderly: Dynamics of nocturnal melatonin suppression at two exposure levels. *Chronobiol Int.* Persons younger than 65 years or with a mean age less than 65 years old

2009;26(4):726-739.

28. Friedman L, Zeitzer JM, Kushida C, Zhdanova I, Noda A, Lee T, et al. Scheduled bright light for treatment of insomnia in older adults. *J Am Geriatr Soc.* 2009;57(3):441-452.

Persons younger than 65 years or with a mean age less than 65 years old
29. Tsai S, Barnard KE, Lentz MJ, Thomas KA. Twenty-four hours light exposure experiences in postpartum women and their 2-10-week-old infants: An intensive within-subject design pilot study. *Int J Nurs Stud.* 2009;46(2):181-188.

Persons younger than 65 years or with a mean age less than 65 years old
30. Lieveise R, Nielen MMA, Veltman DJ, Vitdehaag BMJ, van Someren EJW, Smit JH, et al. Bright light in elderly subjects with nonseasonal major depressive disorder: A double blind randomised clinical trial using early morning bright blue light comparing dim red light treatment. *Trials.* 2008;9:48.

Patients with no cognitive impairment
31. Gammack JK. Light therapy for insomnia in older adults. *Clin Geriatr Med.* 2008;24(1):139-149.

No original research
32. García-Corpas JP, Amariles P, Faus MJ. Light therapy: Its effectiveness in treating insomnia in elderly patients. *Aten Prim.* 2008;40(2):101-103.

No original research
33. Grandner M, Kripke D, Langer R. Light exposure is related to social and emotional functioning and to quality of life in older women. *Psychiatry Res.* 2006;143(1):35-

Patients with no cognitive impairment

- 42.
34. Loving RT, Kripke DF, Knickerbocker NC, Grandner MA. Bright green light treatment of depression for older adults [ISRCTN69400161]. *BMC Psychiatry*. 2005;5:42. Patients with no cognitive impairment
35. Loving RT, Kripke DF, Elliott JA, Knickerbocker NC, Grandner MA. Bright light treatment of depression for older adults [ISRCTN55452501]. *BMC Psychiatry*. 2005;5:41. Patients with no cognitive impairment
36. Tsai YF, Wong TKS, Juang YY, Tsai HH. The effects of light therapy on depressed elders. *Int J Geriatr Psychiatry*. 2004;19(6):545-548. Patients with no cognitive impairment
37. Skjerve A, Bjorvatn B, Holsten F. Light therapy for behavioural and psychological symptoms of dementia. *Int J Geriatr Psychiatry*. 2004;19(6):516-522. No original research
38. Chikamori F, Kuniyoshi N, Shibuya S, Takase Y. Perioperative music therapy with a key-lighting keyboard system in elderly patients undergoing digestive tract surgery. *Hepatogastroenterology*. 2004;51(59):1384-1386. Not using light therapy
39. Harrison Y. The relationship between daytime exposure to light and night-time sleep in 6-12-week-old infants. *J Sleep Res*. 2004;13(4):345-352. Persons younger than 65 years or with a mean age less than 65 years old
40. Kirisoglu C, Guilleminault C. Twenty minutes versus forty-five minutes morning bright light treatment on sleep Persons younger than 65 years or with a mean age

- onset insomnia in elderly subjects. *J Psychosom Res.* 2004;56(5):537-542. less than 65 years old
41. Sumaya IC, Rienzi BM, Deegan JF, Moss DE. Bright light treatment decreases depression in institutionalized older adults: A placebo-controlled crossover study. *J Gerontol A Biol Sci Med Sci.* 2001;56(6):M356-M360. Patients with no cognitive impairment
42. Klerman EB, Duffy JF, Dijk DJ, Czeisler CA. Circadian phase resetting in older people by ocular bright light exposure. *J Invest Med.* 2001;49(1):30-40. Patients with no cognitive impairment
43. Mishima K, Okawa M, Hozumi S, Hishikawa Y. Supplementary administration of artificial bright light and melatonin as potent treatment for disorganized circadian rest-activity and dysfunctional autonomic and neuroendocrine systems in institutionalized demented elderly persons. *Chronobiol Int.* 2000;17(3):419-432. No original research
44. Van Someren E, Swaab D, Colenda C, Cohen W, McCall W, Rosenquist P. Bright light therapy: Improved sensitivity to its effects on rest-activity rhythms in Alzheimer patients by application of nonparametric methods. *Chronobiol Int.* 1999;16(4):505-518. No original research
45. Koyama E, Matsubara H, Nakano T. Bright light treatment for sleep-wake disturbances in aged individuals with dementia. *Psychiatry Clin Neurosci.* 1999;53(2):227-229. Absence of measurement criteria to determine cognitive impairment
46. Ohashi Y, Okamoto N, Uchida K, Iyo M, Mori N, Morita Y. Not designed to study the

- Daily rhythm of serum melatonin levels and effect of light exposure in patients with dementia of the Alzheimer's type. *Biol Psychiatry*. 1999;45(12):1646-1652. effect of light therapy on behavioral and psychological symptoms of dementia or cognitive impairment
47. Kohsaka M, Fukuda N, Honma H, Kobayashi R, Sakakibara S, Koyama E, et al. Effects of moderately bright light on subjective evaluations in healthy elderly women. *Psychiatry Clin Neurosci*. 1999;53(2):239-241. Patients with no cognitive impairment
48. Sakakibara S, Kohsaka M, Kobayashi R, Honma H, Fukuda N, Koyama T. Effects of morning bright light in healthy elderly women: Effects on wrist activity. *Psychiatry Clin Neurosci*. 1999;53(2):235-236. Persons younger than 65 years or with a mean age less than 65 years old
49. Kobayashi R, Kohsaka M, Fukuda N, Sakakibara S, Honma H, Koyama T. Effects of morning bright light on sleep in healthy elderly women. *Psychiatry Clin Neurosci*. 1999;53(2):237-238. Persons younger than 65 years or with a mean age less than 65 years old
50. Cooke K, Kreydatus M, Atherton A, Thoman E. The effects of evening light exposure on the sleep of elderly women expressing sleep complaints. *J Behav Med*. 1998;21(1):103-114. Patients with no cognitive impairment
51. Ancoli-Israel S, Klauber MR, Jones DW, Kripke DF, Martin J, Mason W, et al. Variations in circadian rhythms of activity, sleep, and light exposure related to dementia in nursing-home patients. *Sleep*. 1997;20(1):18-23. Not using light therapy

- | | |
|---|---------------------------------------|
| 52. Murphy PJ, Campbell SS. Enhanced performance in elderly subjects following bright light treatment of sleep maintenance insomnia. <i>J Sleep Res.</i> 1996;5(3):165-172. | Patients with no cognitive impairment |
| 53. Genhart MJ, Kelly KA, Coursey RD, Datiles M, Rosenthal NE. Effects of bright light on mood in normal elderly women. <i>Psychiatry Res.</i> 1993;47(1):87-97. | Patients with no cognitive impairment |
| 54. Campbell SS, Kripke DF, Gillin JC, Hrubovcak JC. Exposure to light in healthy elderly subjects and Alzheimers patients. <i>Physiol Behav.</i> 1988;42(2):141-144. | Not using light therapy |

B. RESULTS FROM MEDLINE

- | | |
|---|---|
| 55. Martiny K. Bright light treatment is effective in treating older patients with non-seasonal major depression. <i>Evid Based Nurs.</i> 2011;14(4):117-118. | No original research |
| 56. Kripke DF. Bright light treatment reduces symptoms in older adults with non-seasonal major depression. <i>Evid Based Nurs.</i> 2011;14(3):75. | No original research |
| 57. Figueiro MG, Lesniak N, Rea MS. Implications of controlled short-wavelength light exposure for sleep in older adults. <i>BMC Res Notes.</i> 2011;4:334. | Persons younger than 65 years or with a mean age less than 65 years old |
| 58. Anonymous. Brighter daytime lighting may improve dementia. <i>Mayo Clin Health Lett.</i> 2008;26(11):4. | No original research |
| 59. Anonymous. Bright lights may improve dementia symptoms. <i>Harv Ment Health Lett.</i> 2008;25(3):7. | No original research |

60. Sloane PD, Figueiro M, Cohen L. Light as therapy for sleep disorders and depression in older adults. *Clin Geriatr.* 2008;16(3):25-31. No original research
61. Goldberg DJ, Hussain M, Fazeli A, Berlin AL. Treatment of skin laxity of the lower face and neck in older individuals with a broad-spectrum infrared light device. *J Cosmet Laser Ther.* 2007;9(1):35-40. No original research
62. Anonymous. Conquering insomnia helps people with Alzheimer's. Sleep hygiene programs, exercise and daytime exposure to light can alleviate sleep disturbances. *Health News.* 2006;12(3):9-10. No original research
63. Sutherland D, Woodward Y, Byrne J, Allen H, Burns A. The use of light therapy to lower agitation in people with dementia. *Nurs Times.* 2004;100(45):32-34. No original research
64. Wakamura T, Tokura H. Influence of bright light during day time on sleep parameters in hospitalized elderly patients. *J Physiol Anthropol Appl Human Sci.* 2001;20(6):345-351. Patients with no cognitive impairment
65. Dawson P. Bright light treatment for people with Alzheimer's disease. *Perspectives.* 1999;23(1):25-26. No original research
-