

REFLEXOLOGY, ALZHEIMER'S DISEASE, AND SLEEP A CASE STUDY

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Introduction

Alzheimer's Disease (AD) is a progressive neurologic disorder that is characterized by a decline in cognitive abilities, reasoning and memory. It is the most common cause of dementia in people over 65 (1). The National Institute on Aging estimates that over 5 million Americans have AD and that it is the third leading cause of death in the elderly (2).

Behavioral changes of AD include wandering, aggression, anxiety, agitation, and sleeplessness (3). Sleep changes in AD include frequent awakening and staying awake for longer periods of time during the night (4). Sleep disturbances can be particularly difficult for caregivers, who are under a great deal of personal stress that is only compounded by fatigue. A lack of sleep can also add to the already challenged cognitive and physical abilities of the person with AD. Improving sleep patterns is believed to be one way to improve the quality of life of both the individual and caregiver.

Interventions to improve sleep in individuals with AD include both pharmacological and non-pharmacological therapies. The Alzheimer's Association discusses the use of tricyclic antidepressants, benzodiazepines, sleeping pills, atypical antipsychotics and classical antipsychotics as medications used to aid sleep. Side effects of these medications include increased risk of falls, confusion, stroke, and sudden death. Non-pharmacologic interventions suggested include regular exercise, avoidance of alcohol, caffeine and nicotine; maintenance of a regular schedule for bedtime as well as a comfortable relaxing sleep environment. (4)

In addition to these behavioral and environmental changes, complementary and integrative health therapies offer another option for the management of insomnia.

The National Center for Complementary and Integrative Health suggests modalities such as relaxation techniques, mindfulness based meditation, melatonin, yoga, hypnotherapy, acupuncture and massage therapy as considerations for the treatment of sleep disturbances (5). The successful use of therapies such as melatonin, valerian, Tai chi, acupuncture, acupressure, yoga and meditation in older adults has also been reviewed (6).

Reflexology is another complementary therapy that has been suggested to promote relaxation and improve sleep (7). The American Reflexology Certification Board defines reflexology as “a scientific art based on the premise that there are zones and reflex areas in the feet and hands which correspond to all body parts. The physical act of applying specific pressures using thumb, finger and hand techniques result in stress reduction which causes a physiological change in the body” (8).

Review of Literature

Several research studies and systematic reviews were found addressing reflexology and insomnia. One study specifically included an elderly population. Suggestions on reflex points effecting insomnia were also found in the literature and will be referenced in the methods section.

Hughes et.al conducted a feasibility study for a randomized controlled study to investigate acupuncture and reflexology for the management of insomnia (9). Ten participants completed this study, which showed a clinically relevant improvement in two out of three participants in sleep scores in the reflexology and acupuncture groups. Li et.al also found an improvement in sleep quality when reflexology was administered to sixty-five post partum women in a randomized controlled trial (10). Both these studies used the Pittsburg sleep quality index (PSQI) as a measure of quality of sleep.

In 2011 Lee et.al conducted a systematic review and meta-analysis of forty-five studies that researched the effects of foot reflexology on fatigue, sleep and pain (11). They concluded that foot reflexology is useful in relieving pain and promoting sleep. Yeung et.al reviewed forty randomized controlled studies using acupressure, reflexology, and auricular acupressure for the relief of insomnia (12). These modalities were all found to be better alone or in combination with

routine care than routine care alone for relieving insomnia. However, due to the limitations of the studies reviewed, the researchers were unable to draw a definite conclusion on the benefits of acupressure and reflexology on promoting adequate sleep.

Valizadeh, Seyyedrasooli, Zamanazadeh and Khadijeh compared the effects of reflexology and footbath on the quality of sleep in elderly participants (13). They noted a statistically significant change in PSQI scores in both the footbath and reflexology groups when compared to the control group. There was no difference found between the reflexology and footbath groups as both improved quality of sleep in their elderly participants. The studies reviewed showed no negative effects from reflexology on sleep patterns, but were inconclusive in proving consistent statistically significant benefits from reflexology on sleep scores.

Purpose

The purpose of this case study was to explore the effects of reflexology on the sleep pattern and morning mood, of an 87-year-old elderly woman diagnosed with Alzheimer's disease.

Participant

The participant in this case study is an 87 year-old Caucasian woman diagnosed with Alzheimer's Dementia in 2011. Additional medical history includes atrial fibrillation and hypothyroidism. Her atrial fibrillation is asymptomatic and she does not take any medications to control her cardiac arrhythmia. The participant is a widow and lives in an independent personally owned residence with the support of her family. She requires companion care during the day and at the time of the study, was progressing to the point of requiring companion care through the night.

She is in fairly good physical health and exercises three to four times a week in the gym at a local senior center. She also attends group exercise classes as well as yoga once a week. She walks with the assistance of a cane. She bathes and dresses herself with assistance and requires full assistance in meal preparation and medication administration. She has significant memory loss and requires

assistance in determining the month and day of the week. She has difficulty remembering and describing her recent physical symptoms and experiences.

Her medications at the time of the study included Synthroid, Trazadone, Baby Aspirin, Cranberry Pills, Vitamin D3 and Vitamin B12. The trazadone was prescribed in a 50mg dose for sleep. Her family reported her frequent awakenings and wandering to her primary physician who recommended Trazadone at night. Previously, melatonin and Ativan were also prescribed but were discontinued due to side possible side effects and a lack of improvement in sleep.

The participant is a retired registered nurse and has had experience with reflexology when she tried this modality in the late 1970's. She and her family agreed to her participation in the case study.

Method

The purpose of the case study was explained to the participant and her medical power of attorney, which is her daughter. Written consent was obtained from the participant and verbal consent from her daughter (Appendix A).

Data on the participant's sleep pattern was collected using an activity wristband. Each evening the band was applied at 9pm and was then removed when the participant awakened each morning. Data from the band was downloaded on the therapist's phone and recorded on a log. Variables for sleep included sound sleep, light sleep, total time awake, number of times awakened, total time to fall asleep and total time asleep.

Subjective descriptive data was unable to be consistently obtained from the participant due to the progression of AD symptoms. Therefore a five point visual scale was used to determine the participant's mood each morning (14) (Appendix B). The scale was obtained through an Internet image search. The participant was presented with the visual Check In and asked, "Which picture do you feel like this morning?" Additionally, the therapist recorded her observations of the participant's mood using the same scale. If the participant offered any descriptive data, this was recorded as well.

The case study was conducted from August 18, 2015 to September 14, 2015. Baseline sleep data were obtained from August 18, 2015 to August 24, 2015

(Appendix C). Reflexology sessions were given on August 24, 27, 30 and September 3, 6, and 9. Sessions were thirty minutes in length and given on a reflexology zero gravity chair in the participant's living room. No music, lotion, hydrotherapy or aromatherapy was used. The participant was provided with a pillow under her head and knees and a blanket. Sessions were given between 7pm and 9pm.

The techniques utilized in the sessions included opening and closing relaxation techniques, thumb and finger walking, push and pull of metatarsals, press and roll of brain reflexes, rotating on a point, strolling, hook and press of pituitary and pineal points, and ROM of the digits and ankle. The following points were emphasized during the sessions: solar plexus, pineal gland, pituitary gland and brain. These points were selected for insomnia and dementia based on the recommendations of three sources (15,16,17). The participant also had a history of atrial fibrillation and therefore heart reflexes were also emphasized. During the baseline assessment phase, the participant verbalized complaints of lower back pain on most days and therefore spinal points were also included.

SOAP notes were completed after each session documenting subjective and objective findings during the session. Subjective information was difficult to obtain from the participant, who slept through all sessions and when awakened was somewhat disoriented. Therefore, the morning check-in was used for her subjective data. Additional attempts were made to solicit information on how the participant was feeling. For example, "Why are you a '3' this morning?" If this information was provided it was recorded in the participant's words.

Results

Participant Data

Data were analyzed in four blocks of 7 days each (Appendix C, D, E, F). The initial block was the baseline period of August 18-August 24 (Appendix C). Sleep and morning mood variables measured were averaged for the week and then compared to the baseline week (Appendix G). All sleep parameters increased during the reflexology weeks or remained the same except "Time to Sleep", which decreased.

The baseline data was then compared to the sleep scores on the evening of the reflexology sessions (Appendix H). These scores were recorded the next morning

and represented the sleep pattern on the evening immediately after the sessions. Again, all sleep scores increased or remained the same. These scores appear to be some of the highest during the study period. For example the Times Awake increased from 2.6 during the baseline period to an average of 4.5 for the evening after the sessions and some scores were as high as 7. This means the participant awakened 7 times during the night of the reflexology session.

There was a positive change (decrease in scores) in morning mood after the reflexology sessions began and this trend continued through the study. There was also a decrease in complaints of back pain once the reflexology sessions began. During the baseline period, the participant complained of a racing heart and vaginal pain. These complaints resolved after the sessions started.

Therapist Data

Areas of congestion noted by the therapist during the sessions included the solar plexus and kidney/adrenal reflexes. This congestion remained consistent through all six sessions in both feet. However during the first session tenderness was noted by the participant in the right and left solar plexus reflexes and during the remainder of the sessions, no tenderness was noted.

There was no tenderness noted by the participant in the kidney/adrenal reflexes. The pituitary reflex was tender in the first three sessions and this tenderness resolved in the last three sessions.

Discussion

Results of this case study cannot be generalized to the population of elderly or the population of persons with Alzheimer's disease. However, for the practicing therapist, some findings may be useful for the practicing therapist.

The positive effect of reflexology on the participant's mood should be considered when recommending or using this modality with elderly persons with Alzheimer's disease. Additionally, the decrease in physical complaints is an apposite finding supportive of reflexology's use in elderly persons with AD. More research is needed to determine what protocols are effective to enhance mood and improve physical symptoms in elderly persons with AD. Training caregivers in beneficial reflexology techniques should be considered and would be an excellent topic for future research.

Of particular note and caution, is the effect of the sessions on the sleep patterns of the participant. The times the participant awakened after the session increased and this was interpreted as getting up and out of bed in the middle of the night. This activity increases the person with AD fall risk.

The therapist hypothesized that these awakenings were due to voiding and perhaps consistent with the congestion noted in the kidney and adrenal reflexes as well as the emphasis placed on this congestion. Additionally the time of day of the sessions may have had a bearing on the sleep disruption. Sessions were all given in the evening and immediately before the participant's usual bedtime. Further research is needed to determine if altering the time of day and perhaps giving sessions in the afternoon or morning would have a more positive effect on sleep patterns.

Alzheimer's Disease represents a huge burden to caregivers as well as persons with AD. Improving the quality of life for both individuals is a notable and important goal. In this study, reflexology improved morning mood and decreased physical symptoms in the participant. Caution should be used when using this modality for sleep improvement and awareness of the time of day of sessions are given is a reasonable consideration for the reflexology therapist.

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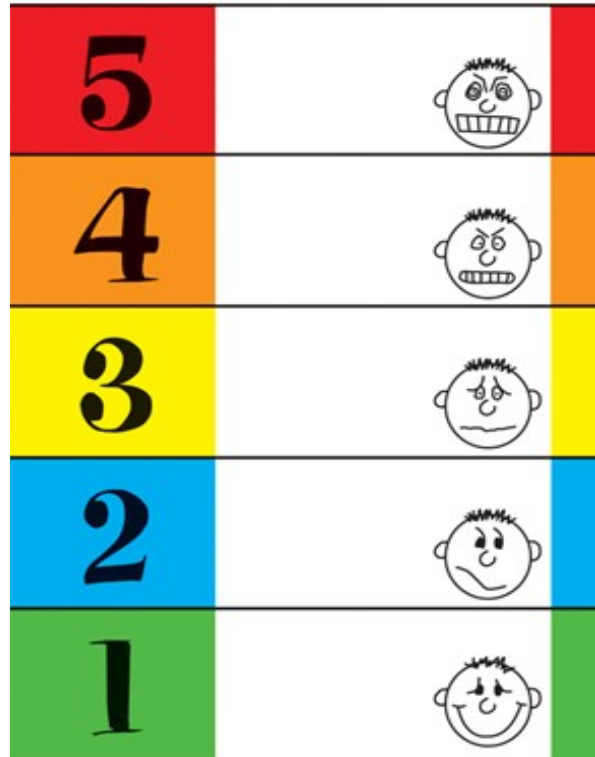
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After reading the above information, I consent to participate in this case study.

Appendix B

CHECK IN



Developed by Kari Dunn Brown and Mitzi Curtis
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Appendix C
Baseline Data
August 18-August 24

Date	Sound Sleep	Light Sleep	Time Awake	# Times Awake	Time to Sleep	Total Time Asleep	P Check In	Subjective Data
8-18	5h50m	2h16m	1h34m	2	35m	8h6m	5	Lower back pain Vaginal Pain
8-19	5h	2h41m	56m	1	19m	7h41m	3.5	
8-20	5h6m	3h4m	1h15m	3	6m	8h10m	3.5	Lower back pain
8-21	4h39m	3h33m	1hr38m	2	52m	8h13m	4	Vaginal Itching
8-22	5h47m	2h50m	1h39m	4	15m	8h37m	3.5	Lower Back Pain
8-23	No data	No data	No data	No data	No data	7h30m	3	Heart Racing
8-24	6h49m	2h50m	2h21m	4	46m	9h19m	4	Back Pain
Average	5h31m	2h50m	1h33m	2.6	29m	8h10m	3.7	

Appendix D
August 25 –August 31
1st Reflexology Week

Date	Sound Sleep	Light Sleep	Time Awake	# Times Awake	Time to Sleep	Total Time Asleep	P Check In	Subjective Data
8-24 Reflexology Session 1 800-830pm								
8-25	4h3m	3h20m	2h13m	2	55m	7h31m	3	No C/O
8-26	4h17m	1h55m	1h47m	2	6m	6h13m	3	No C/O
8-27	5h40m	3h5m	1h7m	3	6m	8h46m	2	No C/O calm
8-27 Reflexology Session 2 810-840pm								
8-28	7h26m	3h12m	2h41	6	13m	10h36m	2	No C/O good mood
8-29	3h56	2h42m	1h5m	1	12m	6h38	2	No C/O
8-30	5h2m	2h9m	3h31m	6	11m	7h12m	2	Feels "OK" No C/O
8-30 Reflexology Session3 800-830pm								
8-31	4h44m	3h44m	2h4m	3	20m	8h28m	3	No C/O
Average	5h3m	2h50m	2h3m	3.2	17m	7h53m	2.4	2.4

Appendix E
September 1 – September 7
2nd Reflexology Week

Date	Sound Sleep	Light Sleep	Time Awake	# Times Awake	Time to Sleep	Total Time Asleep	P Check In	Subj Data
9-1	4h44m	2h18m	2h2m	3	52m	7h2m	2	No C/O
9-2	3h55m	3h28m	1h42m	3	31m	7h24m	1	No C/O
9-3	4h36m	2h23m	1h	2	41m	7h	2	No C/O
9-3 Reflexology Session4 810-840pm								
9-4	2h28	3h2m	1h50m	4	6m	5h30m	2	No C/O
9-5	6h21m	3hr6m	1h23m	3	25m	10h51m	3	No C/O
9-6	4h41m	2h1m	1h6m	2	14m	6h42m	3	Lower Back pain
9-6 Reflexology Session5 800-830pm								
9-7	4hr	3h37m	1h54m	5	5m	7h37m	3	No C/O calm relaxed
Average	4h20m	2h49m	1h33m	3	29m	7h28m	2.2	

Appendix F
September 8 to September 14
3rd Reflexology Week

Date	Sound Sleep	Light Sleep	Time Awake	# Times Awake	Time to Sleep	Total Time Asleep	P Check In	Subj Data
9-8	3h38m	3h42m	1h46m	2	50m	7h20m	2	No C/O
9-9	4h45m	2h36m	2h7m	2	13m	7h22m	3	No C/O
9-9 Reflexology Session 750-820pm								
9-10	3h44m	3h41m	2h17m	7	5m	7h26m	2	No C/O
9-11	7h50m	3h47m	1h52m	3	29m	11h37m	2	No C/O
9-12	2h58m	4h31m	2h28m	3	33m	7h32m	1	No C/O
9-13	4h36m	2h51m	2h21m	4	6	7h27m	2	No C/o
9-14	5h17m	1h58m	59m	1	11m	7h15m	3	No C/O
Average	4h41m	3h13m	1h56m	3.1	21m	7h55m	2.1	

Appendix G
Aggregate Data for Baseline and Reflexology Weeks

Date	Sound Sleep	Light Sleep	Time Awake	# Times Awake	Time to Sleep	Total Time Asleep	P Check In
Baseline Week	5h31m	2h50m	1h33m	2.6	29m	8h10m	3.7
1 st Reflexology Week	5h3m	2h50m	2h3m	3.2	17m	7h53m	2.4
2 nd Reflexology Week	4h20m	2h49m	1h33m	3	29m	7h28m	2.2
3 rd Reflexology Week	4h41m	3h13m	1h56m	3	21m	7h55m	2.1
Average of Reflexology Weeks	4h39m	2h55m	1h48m	3	22	7h45m	2.2

Appendix H
Aggregate Data for Baseline and Evening of Reflexology Sessions

Date	Sound Sleep	Light Sleep	Time Awake	# Times Awake	Time to Sleep	Total Time Asleep	P Check In
Baseline	5h31m	2h50m	1h33m	2.6	29m	8h10m	3.7
Session 1	4h3m	3h20m	2h13m	2	55m	7h31m	3
Session 2	7h26m	3h12m	2h41m	6	13m	10h36m	2
Session 3	4h44m	3h44m	2h4m	3	20m	8h28m	3
Session 4	2h28m	3h2m	1h50m	4	6m	5h30m	2
Session 5	4h	3h37m	1h54m	5	5m	7h37m	3
Session 6	3h44m	3h41.	2h17m	7	5m	7h26m	2
Session Average	4h24m	3h26m	2h5m	4.5	17m	7h49m	2.5