

Article type: Concepts, Conjectures, and Hypotheses in Dementia

Hypothesis: Dementia diminishes interdependence in health and quality of life among spousal partners

Keywords: Alzheimer disease; caregiver; dementia; interdependence; spouse; wellbeing

Introduction

We present a hypothesis that dementia may create a unique dynamic for spousal partners by diminishing their interdependence in health and quality of life. Below, we briefly review prior literature to explain the hypothesis and present some initial evidence in support from a trial dataset. We hope that researchers will test our hypothesis with their datasets, and that this article inspires further research into the relationship dynamics between people living with dementia and their partners and implications for their health and quality of life.

As the disease progresses, people living with dementia become increasingly dependent on family and friends for everyday activities and care. While some receive formal paid care, the majority of care provided for those living at home is by informal carers (also termed caregivers) and often family members including spouses (referred to as carers throughout here). Often, especially with older people, the distinction between those providing and those receiving informal care can become blurred making definitions of the caring role problematic. While definitions of carer vary, a consistent feature is the provision of unpaid care.¹ In the United Kingdom, it is estimated that over 61 per cent of people with dementia aged 60 and above live at home supported by over 700,000 carers to the value of £11.6 billion per annum.²

Data from the United Kingdom, France, and Germany suggest that approximately two thirds of carers of people living with dementia are spouses.³ Being a carer can impact on quality of life, defined as an “individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns”⁴, p.1405 Research with spouses suggests that over time the health and quality of life of both partners converge. Indeed, the health of each partner is interdependent on the other, and this interdependence is greater among older people.⁵ For example, 6-year longitudinal data from Europe suggest that as married couples age, a spouse’s quality of life,

cognition, and health is predictive of their partner's quality of life.⁶ Diary studies also suggest that daily emotions are contagious between married couples.⁷ Such interdependence in emotional and relational wellbeing has also been identified in non-spousal informal carers of relatives with a chronic illness, physical disability, or frailty due to ageing.⁸ Therefore, through daily interaction, emotion transmission, and shared behaviours and experiences,⁵ as with spouses generally, we might expect the perceived quality of life of people living with dementia to converge over time and become similar to that of their spousal carer. Similarly, quality of life among carers of people with various conditions has been found to be negatively associated with carer burden.⁹ Therefore, we might expect interdependence in quality of life to be directly and negatively associated with carer burden. i.e., if a person with dementia has low quality of life scores then we would predict not only lower scores of carer quality of life, but also higher scores of carer burden.

However, self-reports of health and quality of life require insight into one's own condition. Lack of insight, or anosognosia, refers to an individual's unawareness of the impact their medical condition has on their everyday functioning.¹⁰ Given that dementia is a degenerative neurological disease characterised by a chronic, global, and non-reversible loss of cognitive functioning,¹¹ an accompanying decline of insight into their condition is eventually identified in nearly all people living with dementia.¹⁰ In the context of quality of life, prior studies have found a discrepancy in quality of life ratings made by people living with dementia and proxy ratings from their carers. Some authors argue that a lack of insight by people living with dementia into the impact of their condition leads to this divergence in ratings.^{e.g. 12} This would explain the stability of quality of life scores from people living with dementia over time but a gradual deterioration (in accord with expectation for a degenerative neurological disease) when reported in proxy by their carers.¹²

If people living with dementia become unaware of the impact of their condition, then their ability to report their level of quality of life in a manner that is congruent with their carer will also decline. Therefore, a lack of convergence in self-reported health and quality of life may develop among couples of a person living with dementia and their spousal carer.

Hypothesis

Our hypothesis is that dementia creates a unique context for spousal partners where interdependence in health and quality of life diminishes.

Initial evidence in support of the hypothesis

We conducted a secondary analysis of data on quality of life and carer burden from a randomised controlled trial with community-dwelling people living with dementia and their carers recruited as dyads.¹³ Self-reported quality of life from both dyad members, and carer burden, were collected at baseline and again six months later. As well as investigating the relationship between people with dementia and their spousal carers' quality of life, we were also interested in the relationship between quality of life of people with dementia and carer burden. This was because of the highly significant correlation between carer quality of life and carer burden,⁹ and the interest among researchers and policy makers to reduce carer burden to help support carers in their important role.¹ Thus, carer burden was our selected dependent variable for multivariate analyses to test our hypothesis of interdependence of health and quality of life between people with dementia and their spousal carers.

We used data at baseline and separately at the six-month follow-up in two sets of analyses. First, using baseline data, we tested the associations between quality of life of the person with dementia and their spousal carer's quality of life and carer burden. We then tested if quality of life of both the person with dementia and the spousal carer could predict

carer burden. Second, we tested the associations between quality of life of the person with dementia and their spousal carer's quality of life and carer burden at follow-up, using both baseline and follow-up data. We then tested whether quality of life of both the person with dementia and the spousal carer could predict carer burden at follow-up (see Supplemental Digital Content 1 for a full explanation of the method for this analysis).

Participants were recruited from 06/04/2017 to 17/07/2018, with the final follow-up completed on 30/11/2018. For the current analyses, 65 people living with dementia and their spousal carers provided data at baseline, and 54 at the 6-month follow-up. All couples were married and living together (see Table 1 for demographic details of participants at baseline and Supplemental Digital Content 2 - Table S1 for descriptive statistics for the variables at baseline and follow-up).

<<Table 1 about here>>

Carer burden at baseline

The output from the Pearson bivariate correlations is presented in Table 2. People living with dementia and carer quality of life at baseline were not significantly associated. For carer burden at baseline, the only baseline variable significantly ($p < 0.10$) associated with it was carer quality of life. Baseline measures from people living with dementia (quality of life and cognitive functioning) were not significantly associated with baseline carer burden.

Therefore, only baseline carer quality of life was entered into the regression that explained 43 per cent of the variance in carer burden at baseline ($F(1,61) = 47.82, p < 0.001, B = -52.54, SE = 7.60, \text{adjusted } R^2 = 0.43$).

<<Table 2 about here>>

Carer burden at follow-up

The results in Table 2 suggest that baseline and follow-up quality of life of people living with dementia were not significantly associated with carer quality of life at follow-up. For carer burden at follow-up, the only baseline variables significantly ($p < 0.10$) associated with it were carer burden and carer quality of life. Baseline measures from people living with dementia (quality of life and cognitive functioning) were not significantly associated with follow-up carer burden. For the variables at follow-up, the only variables significantly ($p < 0.10$) associated with carer burden at follow-up were carer quality of life and cognitive functioning of people living with dementia. The quality of life of people living with dementia was not significantly associated with carer burden at follow-up. Therefore, baseline carer burden, baseline and follow-up carer quality of life, and cognitive functioning of people living with dementia at follow-up were entered into the regression that explained 65 per cent of the variance in carer burden at follow-up ($F(4,43) = 22.30, p < 0.01, \text{adjusted } R^2 = 0.65$). Of the four variables entered, only baseline carer burden ($B = 0.57, SE = 0.11, p < 0.001$) and follow-up carer quality of life ($B = -23.02, SE = 8.20, p = 0.10$) significantly predicted carer burden at follow-up (baseline carer quality of life: $B = 5.42, SE = 10.00, p = 0.59$; follow-up people living with dementia cognition: $B = 0.00, SE = 0.12, p = 0.98$).

Discussion

In summary, the above analyses provide initial evidence from both baseline and follow-up data that reports from people living with dementia on their quality of life were not significantly associated with either carer quality of life or carer burden. Thus, in contrast to spouses in general, due to a lack of interdependence when a spousal partner has dementia, the quality of life of one partner cannot be predicted based on characteristics of the other. This also means that interventions designed to improve the health and quality of life of people

living with dementia and their carers may not necessarily benefit both partners. This has been observed in prior randomised controlled trials. For example, an intervention that increased walking among people living with dementia and their carers reported no benefit for people living with dementia but a reduction in carer burden.¹⁴ Additionally, in our Tai Chi intervention, we reported significantly higher quality of life among people living with dementia in the Tai Chi group relative to the control group but not their carers.¹³ This suggests that unless they are appropriately adapted, interventions for dyads may only be effective in improving the quality of life of either the person living with dementia or their carer but not both, even when both participate in the intervention.

Limitations of initial evidence and directions for future research

We acknowledge that our proposed explanation for a diminishment in interdependence between spousal carers was not tested in the above study. Therefore, alternative explanations are possible and future research could explore the mechanisms behind this relationship. Further, we recognise that the above initial dataset had limitations regarding the sample and measures used. This was a secondary analysis of people living with dementia and their carers recruited for a trial evaluating the efficacy of Tai Chi on postural balance.¹³ Therefore, the sample may not necessarily be representative of the general population of people living with dementia and their spousal carers. Future research with larger and more representative samples are needed that will afford subgroup analyses to fully test our hypothesis. Further, the number of years married / in partnership, and number of years living with dementia and severity of symptoms could be examined for their relationship with the degree of convergence in ratings of quality of life.

Future research might include additional variables. For example, relationships have been identified between carer burden and other variables including carer's perceived change

in identity in the person with dementia and relationship quality.¹⁵ Lastly, the measure of quality of life used in this study was relatively new and so did not readily lend itself to direct comparisons with prior studies. Future research could use both generic and dementia-specific measures of quality of life to test the similarity of their relationships with carer burden.

Conclusion

Our hypothesis is that dementia creates a unique dynamic for spousal partners by diminishing their interdependence in health and quality of life. We call on dementia researchers to collect data and conduct secondary data analyses to test our hypothesis and explore its implications for the health and quality of life of both people living with dementia and their carers.

List of Supplemental Digital Content

Supplemental Digital Content 1.docx (full explanation of the method)

Supplemental Digital Content 2.docx (Table S1 descriptive statistics)

Declaration of conflict of interests

The authors declare that there is no conflict of interest.

References

1. Bastawrous M. Caregiver burden--a critical discussion. *Int J Nurs Stud.* 2013;50:431-41.
2. Prince M, Knapp M, Guerchet M, et al. *Dementia UK: Update (second edition)*. London: Alzheimer's Society; 2014.
3. Wimo A, Reed CC, Dodel R, et al. The GERAS Study: A prospective observational study of costs and resource use in community dwellers with Alzheimer's disease in three European countries--study design and baseline findings. *J Alzheimers Dis.* 2013;36:385-99.
4. The WHOQOL Group. The World Health Organization Quality of Life assessment (WHOQOL): Position paper from the World Health Organization. *Soc Sci Med.* 1995;41:1403-9.
5. Kiecolt-Glaser JK, Wilson SJ. Lovesick: How couples' relationships influence health. *Annu Rev Clin Psychol.* 2017;13:421-43.
6. Bourassa KJ, Memel M, Woolverton C, et al. A dyadic approach to health, cognition, and quality of life in aging adults. *Psychol Aging.* 2015;30:449-61.
7. Schoebi D. The coregulation of daily affect in marital relationships. *J Fam Psychol.* 2008;22:595-604.
8. Ferraris G, Dang S, Woodford J, et al. Dyadic interdependence in non-spousal caregiving dyads' wellbeing: A systematic review. *Front Psychol.* 2022;13:882389.
9. Lethin C, Renom-Guiteras A, Zwakhalen S, et al. Psychological well-being over time among informal caregivers caring for persons with dementia living at home. *Aging Ment Health.* 2017;21:1138-46.
10. Wilson RS, Sytsma J, Barnes LL, et al. Anosognosia in Dementia. *Curr Neurol Neurosci Rep.* 2016;16:77.

11. Butler R, Radhakrishnan R. Dementia: Systematic review 1001. *BMJ Clin Evid.* 2012; Accessed 08/04/2022 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3437526/>. doi: <http://clinicalevidence.bmj.com/x/systematic-review/1001/overview.html>.
12. Conde-Sala JL, Rene-Ramirez R, Turro-Garriga O, et al. Clinical differences in patients with Alzheimer's disease according to the presence or absence of anosognosia: implications for perceived quality of life. *J Alzheimers Dis.* 2013;33:1105-16.
13. Blinded for peer-review.
14. Lowery D, Cerga-Pashoja A, Iliffe S, et al. The effect of exercise on behavioural and psychological symptoms of dementia: The EVIDEM-E randomised controlled clinical trial. *Int J Geriatr Psychiatry.* 2014;29:819-27.
15. Enright J, O'Connell ME, Branger C, et al. Identity, relationship quality, and subjective burden in caregivers of persons with dementia. *Dementia (London).* 2020;19:1855-71.