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A Review of Behavioural Gerontology and Dementia Related Interventions

Review Article

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Abstract

Behavioural Gerontology is concerned with the interaction between the aging individual and their environment. One aspect of behavioural gerontology has focussed on the use of behaviourist methods to improve the functioning and quality of life of individuals with dementia. The purpose of this paper is to review existing literature in the field of dementia related Behavioural Gerontology and to highlight its potential as an intervention strategy in nursing home care while also discussing potential limitations of its efficacy. As the field of behavioural gerontology is still in development with quite a sparse number of publications in comparison to other applied fields of the behavioural method, a broad range of papers (1960-2015) were included in the review. Positive reinforcement techniques have been shown to have an effect on dementia related behavioural excesses (wandering, disruptive vocalisations), behavioural deficits (incontinence, difficulties in self-feeding) and mood changes (depression). One of the major concerns about using reinforcement techniques in the case of dementia is maintenance of the behavioural changes with the continual implementation of the intervention. Research has indicated that individuals with dementia meet behavioural extinction criteria at an advanced rate in comparison with individuals without dementia. Thus for a behavioural change to be successfully maintained it requires diligence on the part of the caregiver and/or nursing home staff. In the case of dementia care centres and nursing homes, when using behavioural interventions to modify the behavioural symptoms of dementia, there needs to be a considerable overlap between Behavioural Gerontology and Organisational Behavioural Management to ensure the successful maintenance of behavioural change.

Keywords: Gerontology; Gerontology literature; Dementia; Senile dementia; Alzheimer's disease; Psychophysiology; Operant behaviour; Organizational behaviour.

Introduction

Behavioural Gerontology is “the study of how antecedent and consequent environmental events interact with the ageing organism to produce behaviour.”¹ Behavioural strategies have been proposed to address both non-pathological and pathological age related deficits. Although neurocognitive changes are natural for individuals in later life stages, for some, these changes go beyond what is considered normal and is characterised by a progressive deterioration of functioning.² Dementia is the hypernym used to describe a variety of syndromes characterised by “memory loss and other cognitive deficits” and “impairment of social and occupational functioning.”³ Dementia related behavioural interventions generally aim to recover lost skills (behavioural deficits such as high levels of dependency, loss of communication skills and decrease in activity⁴) or reduce disturbing behaviour (behavioural excess such as aggression, wandering and disruptive verbalisations⁵).⁶ Evidence from studies using behavioural intervention strategies to improve the functioning and quality of life of those with dementia related syndromes will be reviewed. Specific attention will be given to studies using interventions centred on three main categories of dementia related behavioural changes, including behavioural excess (disruptive vocalisations, wandering), behavioural deficits (incontinence, eating disruptions) and mood changes (depression). Finally the limitations of the reviewed interventions will be discussed in light of a potential overlap between Behavioural Gerontology and Organisational Behavioural Management (OBM). OBM is a subordinate discipline within the field of Applied Behavioural Analysis which focuses on producing socially significant changes in behaviour of individuals/groups via the application of behavioural principles in the workplace.⁷ Research has suggested a need for more rigorous study on the efficacy of behaviourist interventions on the behavioural symptoms of dementia, with one of the main concerns being the management and training of staff on the rationale and importance of diligent delivery of such interventions.

As dementia is characterised by a change and/or decline in an individuals’ behavioural repertoire due to neurocognitive changes, the ability for an individual to learn new behaviours becomes less likely. Thus, behavioural interventions for dementia related behavioural decline/change are centred mainly on establishing environmental changes (i.e. antecedents that set the occasion for functional maintenance) or individualised interventions that do not require the establishment of any new behavioural repertoires.⁸ Operant

¹ L D Burgio and K L Burgio, "Behavioral Gerontology: Application of Behavioral Methods to the Problems of Older Adults", *Journal of Applied Behavior Analysis* 19, no. 4 (1986): 321, doi:10.1901/jaba.1986.19-321.

² APA Presidential Task Force on the Assessment of Age-Consistent Memory Decline and Dementia, ‘Guidelines for the Evaluation of Dementia and Age-Related Cognitive Change’ (American Psychological Association, last updated August 15, 2011), <http://www.apa.org/pi/aging/resources/dementia-guidelines.aspx>.

³ Bryan Kolb and Ian Q. Whishaw, *An Introduction to Brain and Behavior*, 4th ed., International ed (New York: Worth, 2014), 589.

⁴ Rebecca Allen-Burge, Alan B. Stevens, and Louis D. Burgio, "Effective Behavioral Interventions for Decreasing Dementia-Related Challenging Behavior in Nursing Homes", *International Journal of Geriatric Psychiatry* 14, no. 3 (March 1999): 213–28, doi:10.1002/(SICI)1099-1166(199903)14:3<213::AID-GPS974>3.0.CO;2-0.

⁵ Ibid.

⁶ Elmar Gräsel, Jens Wiltfang, and Johannes Kornhuber, "Non-Drug Therapies for Dementia: An Overview of the Current Situation with Regard to Proof of Effectiveness", *Dementia and Geriatric Cognitive Disorders* 15, no. 3 (2003): 115–25, doi:10.1159/000068477.

⁷ David A. Wilder, John Austin, and Sarah Casella, "Applying Behavior Analysis in Organizations: Organizational Behavior Management", *Psychological Services* 6, no. 3 (2009): 202, doi:10.1037/a0015393.

⁸ Jeffrey A. Buchanan, "A Review of Behavioral Treatments for Persons with Dementia", *The Behavior Analyst Today* 7, no. 4 (2006): 521, doi:10.1037/h0100092.

contingencies are primarily used to bring about modifications in dementia related behaviour through targeting behavioural antecedents or consequences, or through the use of reinforcement or punishment.⁹ Punishment contingencies are rarely used in this context due strict ethical guidelines implemented by the Behaviour Analyst Certification Board (BACB). That is, reinforcement is preferentially used above punishment. If punishment is to be used, the procedure must be scientifically validated and has to be accompanied by a reinforcement contingency of an alternative behaviour.¹⁰ Individuals with Alzheimer's disease (AD) have been found to preserve the ability to learn operant tasks on fixed-ratio (FR) and fixed-interval (FI) schedules with sensitivity to FI - extinction transitions.¹¹ Spontaneous recovery (temporary reappearance of the learned behaviour after extinction processes have been put in place¹²) does not appear to occur within individuals with AD. Considering that individuals with AD meet extinction criteria faster than those with no cognitive impairment and that they do not exhibit spontaneous recovery, there is some argument for the use of extinction-based interventions as effective and practical behavioural change methods among older adults with dementia.

Interventions of Behavioural Excess Symptoms

Wandering behaviour

Wandering is a behavioural excess pattern and is identified by "aimless, disoriented and continuous ambulation."¹³ Differential reinforcement of other behaviour (DRO) has been used as a possible strategy to reduce wandering behaviour. DRO delivers reinforcement when the target problem behaviour is not occurring.¹⁴ Using a FI-DRO procedure with four individuals exhibiting wandering behaviour, K. Heard and T. S. Watson found that if the consequences which maintain wandering behaviour (subjective to the individual) were made contingent on non-wandering behaviour, a significant decrease in overall wandering behaviour (60-80%) can be observed.¹⁵

A similar interval DRO strategy was utilised in a single-case design study by E. Jozsvai, B. Richards & L. Leach.¹⁶ However, instead of direct reinforcement for non-wandering behaviour, a token economy was implemented. Token economies are a behavioural change intervention in which desired target behaviours are identified, a token is given for each emission of the desired behaviour, and the tokens are exchangeable for backup reinforcers.¹⁷ The DRO interval in this case was steadily extended from 15 – 40 minutes. Intervals are usually increased when a change in behaviour starts to occur. Lengthening the

⁹ Gräsel, Wiltfang, and Kornhuber, "Non-Drug Therapies for Dementia".

¹⁰ BACB, "Guidelines for Responsible Conduct for Behavior Analysts" (Behavior Analyst Certification Board, July 2010), 10, <http://bacb.com/wp-content/uploads/2015/06/guidelines-for-responsible-conduct.pdf>.

¹¹ Adam P Spira and Barry A Edelstein, "Operant Conditioning in Older Adults with Alzheimer's Disease," *The Psychological Record* 57, no. 3 (2007): 6.

¹² John O. Cooper, Timothy E. Heron, and William L. Heward, *Applied Behavior Analysis*, Pearson international ed., 2nd ed (Upper Saddle River: Pearson/Merrill Prentice Hall, 2007).

¹³ K Heard and T S Watson, "Reducing Wandering by Persons with Dementia Using Differential Reinforcement," *Journal of Applied Behavior Analysis* 32, no. 3 (1999): 381, doi:10.1901/jaba.1999.32-381.

¹⁴ Cooper, Heron, and Heward, *Applied Behavior Analysis*, 475.

¹⁵ Heard and Watson, "Reducing Wandering by Persons with Dementia Using Differential Reinforcement"

¹⁶ Emöke Jozsvai, Brian Richards, and Larry Leach, "Behavior Management of a Patient with Creutzfeldt-Jacob Disease," *Clinical Gerontologist* 16, no. 3 (20 May 1996): 11–17, doi:10.1300/J018v16n03_03.

¹⁷ Cooper, Heron, and Heward, *Applied Behavior Analysis*, 560–567.

schedules (schedule thinning) is implemented to encourage the maintenance and generalisation of the behaviour.¹⁸

Findings provided by both of these studies give support to the procedure of making a reinforcing consequence contingent on desired (non-wandering) behaviour as a possible useful strategy in reducing wandering behaviour. However, although in both studies the reinforcement interventions had the desired positive effects on reducing wandering behaviour, at follow-up the participants' behaviour had returned to baseline. As mentioned previously, individuals with dementia meet extinction criteria at an advanced pace compared to individuals with no pathological neurocognitive changes.¹⁹ Thus, it can be argued that the limitation of this technique concerns the maintenance of the strategy after the researcher has left. Long term care facilities have limited staff resources to meet the demands of individualised reinforcement contingencies with haphazard application or the cessation of the intervention leading to the extinction of the previously reinforced non-wandering behaviour.

An alternative approach used in nursing homes to protect their residents from possible harm associated with wandering behaviour involves the use of an alarm. The alarm tags are placed on the residents and sound once they pass certain thresholds.²⁰ Thus, the behaviour of the staff is targeted with the alarms acting as discriminative stimuli that set the occasion for finding the resident under their care; the reinforcing consequence being that the resident doesn't get injured from wandering into a restricted area. Although this method does not reduce the target wandering behaviour it does ensure the safety of the individual.

Disruptive vocalisations

Disruptive vocalisation is the "verbal and non-verbal vocal activity that causes disruption to others and includes screaming, abusive language, moaning, perseveration, and repetitive and inappropriate requests."²¹ The use of operant interventions is useful in the reduction of disruptive vocalisations if positive reinforcement has been made contingent on vocally disruptive behaviour. That is, if attention on staff/caregivers is only given in the case of disruptive behaviour and absent following desirable behaviour (in this case quietness).²²

A single subject design study by researchers M. Baltes & S. Lascomb²³ simultaneously used positive reinforcement and time-out contingencies to reduce target screaming behaviour and increase other 'normal' behaviour. Reinforcement was provided for any non-screaming behaviour while any screaming behaviour was followed by a time-out. Time-out is defined as a contingency in which there is "a withdrawal of the opportunity to earn positive reinforcement for a specific amount of time contingent on the occurrence of behaviour."²⁴ The aim of this method is to reduce/extinguish the target behaviour. However,

¹⁸ Cooper, Heron, and Heward, *Applied Behavior Analysis*, 313–314.

¹⁹ Spira and Edelstein, "Operant Conditioning in Older Adults with Alzheimer's Disease"

²⁰ Elaine Nelson Negley, Patricia M Molla, and Jeanne Obenchain, "NO EXIT: The Effects of an Electronic Security System on Confused Patients," *Journal of Gerontological Nursing* 16, no. 8 (1 August 1990): 21–25, doi:10.3928/0098-9134-19900801-07.

²¹ B. McMinn and B. Draper, "Vocally Disruptive Behaviour in Dementia: Development of an Evidence Based Practice Guideline," *Aging & Mental Health* 9, no. 1 (January 2005): 16, doi:10.1080/13607860512331334068.

²² Ibid.

²³ Margret M. Baltes and Sharon L. Lascomb, "Creating a Healthy Institutional Environment for the Elderly via Behavior Management: The Nurse as a Change Agent," *International Journal of Nursing Studies* 12, no. 1 (March 1975): 5–12, doi:10.1016/0020-7489(75)90003-6.

²⁴ Cooper, Heron, and Heward, *Applied Behavior Analysis*, 357.

it is argued that the use of punishment by removal of a stimulus is unethical in such cases as it may lead to the social exclusion of the resident.²⁵

Interventions of Behavioural Deficits Symptoms

Incontinence

Behaviourist interventions targeting urinary incontinence (UI) include habit retraining, bladder retraining, prompted voiding and timed voiding.²⁶ As a behavioural method, prompting acts as an additional antecedent stimulus that sets the occasion for a behavioural response in the presence of a discriminative stimulus (S^D).²⁷ Within the context of UI, prompting sets the occasion for voiding to come under the control of the feeling of a full bladder (S^D). The prompts involve regularly asking nursing home residents if they need to go to the bathroom and assisting them if they do need to void while offering positive reinforcement as a consequence for continence.²⁸ It usually involves a fixed or flexible systematic schedule²⁹ and is a preferred non-invasive method among families of those in care.³⁰ However, there are some reservations surrounding the sustainability of such an intervention in long term care facilities and whether it possibly increases dependence and decreases dignity of those in care. Even with such reservations, as a technique it has merit as a conservative method of decreasing incontinence in certain cases.^{31, 32, 33, 34, 35} Although it has also been suggested that prompted voiding is not applicable in all cases of incontinence and it is not an appropriate intervention for night-time application.³⁶

Alternatively, timed voiding is a behavioural intervention that is utilised with individuals who are unable to independently manage their own toileting. It is based on a fixed schedule voiding pattern between 2-4 hours. Although it is suggested that timed voiding

²⁵ McMinn and Draper, "Vocally Disruptive Behaviour in Dementia".

²⁶ Brenda Roe et al., "Systematic Reviews of Bladder Training and Voiding Programmes in Adults: A Synopsis of Findings on Theory and Methods Using Metastudy Techniques," *Journal of Advanced Nursing* 57, no. 1 (January 2007): 15–31, doi:10.1111/j.1365-2648.2006.04098.x.

²⁷ Cooper, Heron, and Heward, *Applied Behavior Analysis*, 287.

²⁸ Nancy S Creason et al., "Prompted Voiding Therapy for Urinary Incontinence in Aged Female Nursing Home Residents," *Journal of Advanced Nursing* 14, no. 2 (February 1989): 120–126, doi:10.1111/j.1365-2648.1989.tb00909.x.

²⁹ Joan Ostaszkievicz, Brenda Roe, and Linda Johnston, "Effects of Timed Voiding for the Management of Urinary Incontinence in Adults: Systematic Review," *Journal of Advanced Nursing* 52, no. 4 (November 2005): 420–431, doi:10.1111/j.1365-2648.2005.03608.x.

³⁰ T. M. Johnson et al., "Urinary Incontinence Treatment Preferences in Long-Term Care," *Journal of the American Geriatrics Society* 49, no. 6 (June 2001): 710–718, doi:10.1046/j.1532-5415.2001.49146.x.

³¹ Creason et al., "Prompted Voiding Therapy for Urinary Incontinence in Aged Female Nursing Home Residents".

³² Sharon Eustice, Brenda Roe, and Jan Paterson, "Prompted Voiding for the Management of Urinary Incontinence in Adults," *Cochrane Database of Systematic Reviews*, ed. The Cochrane Collaboration (Chichester, UK: John Wiley & Sons, Ltd, 2000), <http://doi.wiley.com/10.1002/14651858.CD002113>.

³³ J. F. Schnelle et al., "Prompted Voiding Treatment of Urinary Incontinence in Nursing Home Patients. A Behavior Management Approach for Nursing Home Staff," *Journal of the American Geriatrics Society* 37, no. 11 (November 1989): 1051–1057, doi:10.1111/j.1532-5415.1989.tb06919.x.

³⁴ John F. Schnelle, "Treatment of Urinary Incontinence in Nursing Home Patients by Prompted Voiding," *Journal of the American Geriatrics Society* 38, no. 3 (March 1990): 356–360, doi:10.1111/j.1532-5415.1990.tb03521.x.

³⁵ J. G. Ouslander et al., "Predictors of Successful Prompted Voiding among Incontinent Nursing Home Residents," *JAMA* 273, no. 17 (3 May 1995): 1366–1370, doi:10.1001/jama.1995.03520410060027.

³⁶ Joseph G. Ouslander, Nahia Ai-Samarrai, and John F. Schnelle, "Prompted Voiding for Nighttime Incontinence in Nursing Homes: Is It Effective?," *Journal of the American Geriatrics Society* 49, no. 6 (June 2001): 706–709, doi:10.1046/j.1532-5415.2001.49145.x.

is an incomplete theoretically informed construct as it lacks rigorous assessment of the efficacy of its methodology and practice.³⁷ Several limitations have been revealed by existing studies: it is labour intensive with no clear evidence of sustainability or effectiveness; there is no specific consensus on optimal interval length; and individual continence levels have not been considered in the existing research.³⁸ This has led to the argument that fixed schedule voiding can “distort the normal stimulus-response pattern as it may involve voiding at times when the bladder is not necessarily full.”³⁹ Thus it can be argued that although timed voiding has certain benefits, further investigation is required to establish its effectiveness as an intervention.

Eating/Drinking

Factors which may obstruct independent eating behaviour in persons with dementia include difficulty initiating the eating processes as well as dementia severity.⁴⁰ It has been suggested self-feeding can be promoted by eliminating environmental factors (distractors such as noise and movement) and providing assistance promoting the commencement of a meal.⁴¹

M. Baltes & M. Zerbe attempted to re-establish self-feeding in a single case design using an immediate continuous reinforcement program (CRF) (i.e. reinforcement was delivered directly after every instance of self-feeding).⁴² Although the intervention was incomplete, the study did provide some evidence for the effective use of operant techniques in promoting independent eating in individuals with dementia. A more recent study used a similar reinforcement method with the addition of prompts to initiate self-feeding behaviour (i.e. provision of a cue to set the occasion for self-feeding behaviour).⁴³ Eating performance was improved in the intervention group and supported Baltes & Zerbe’s outlook that a dementia diagnosis is not the determining factor whether or not skills such as self-feeding can be re-established.⁴⁴ However, in general CRF is suggested to only be utilised to strengthen behaviour in the initial stages of an intervention and then to be thinned so the behaviour eventually becomes naturally maintained.⁴⁵ With regard to individuals with neurocognitive decline it could be argued that using CRF schedules are generally more applicable, as the establishment or re-establishment of previous behaviours may not necessarily be possible (i.e. not trying to change behavioural repertoire as mentioned previously⁴⁶). It should also be

³⁷ Ostaszkiwicz, Roe, and Johnston, "Effects of Timed Voiding for the Management of Urinary Incontinence in Adults".

³⁸ Ibid.

³⁹ Ostaszkiwicz, Roe, and Johnston, "Effects of Timed Voiding for the Management of Urinary Incontinence in Adults," 421.

⁴⁰ Ayako Eda et al., "Factors Affecting Independence in Eating among Elderly with Alzheimer’s Disease: Eating in the Elderly with AD," *Geriatrics & Gerontology International* 12, no. 3 (July 2012): 481–490, doi:10.1111/j.1447-0594.2011.00799.x.

⁴¹ Eda et al., "Factors Affecting Independence in Eating among Elderly with Alzheimer’s Disease," 489.

⁴² Margret M. Baltes and Melissa B. Zerbe, "Reestablishing Self-Feeding in a Nursing Home Resident," *Nursing Research* 25, no. 1 (January 1976): 24–26, doi:10.1097/00006199-197601000-00007.

⁴³ M. L. Coyne and L. Hoskins, "Improving Eating Behaviors in Dementia Using Behavioral Strategies," *Clinical Nursing Research* 6, no. 3 (August 1997): 275–290, doi:10.1177/105477389700600307.

⁴⁴ Baltes and Zerbe, "Reestablishing Self-Feeding in a Nursing Home Resident".

⁴⁵ Cooper, Heron, and Heward, *Applied Behavior Analysis*, 287,463.

⁴⁶ Buchanan, "A Review of Behavioral Treatments for Persons with Dementia”.

noted that behaviour produced by reinforcement in cases of dementia does not seem to generalise, which influences the level of resistance of the particular behaviour to extinction.⁴⁷

Intervention for Depression (mood changes)

Behavioural activation (BA) is a therapeutic technique based on the learning theory of depression. Findings have suggested that there is a relationship between the intensity of depression and the level of positive reinforcement a person experiences in their day to day lives.⁴⁸ In other words, apathetic social withdrawal and decreased engagement can lead to a decrease in sources of positive reinforcement and thus contribute to feelings of depression.⁴⁹ BA strategies attempt to restore behaviours that produce either contrived or natural reinforcement and focus on increasing the individual's activity level.⁵⁰ In other words, BA intends to increase participation in behaviours that are positively reinforcing and decrease behaviour driven by negative reinforcement (avoidance).⁵¹ Previous research^{52,53} has indicated that increasing pleasant events i.e. events that are positively reinforcing, can lead to enhanced positive affect and a decrease in depressive symptoms. As a therapeutic technique it is suggested that BA shows promise in decreasing depression brought on by activity restriction in the elderly.⁵⁴

Behavioural Gerontology and Organisational Behavioural Management

Although the previously mentioned studies provide evidence for the effectiveness of behavioural interventions in cases of dementia, it has been argued that there is little evidence for behavioural generalisation or continual long term effects.^{55,56} Attaining any enduring changes in the behaviour of individuals with dementia is problematic as the disease is progressive and ultimately leads to more advanced declines in neurocognitive ability. Therefore, for any interventions to be successful, full investment from nursing home staff or caregivers in the implementation of the behavioural intervention procedures on a continual basis is required. This is supported by findings which indicate the passage of time, rather than

⁴⁷ K. Gunnar Götestam and Lennart Melin, "The Effect of Prompting and Reinforcement of Activity in Elderly Demented Inpatients," *Scandinavian Journal of Psychology* 31, no. 1 (March 1990): 2–8, doi:10.1111/j.1467-9450.1990.tb00796.x.

⁴⁸ Peter M. Lewinsohn and Julian Libet, "Pleasant Events, Activity Schedules, and Depressions," *Journal of Abnormal Psychology* 79, no. 3 (1972): 291, doi:10.1037/h0033207.

⁴⁹ Jessica Price, "Behavioural Activation: An Alternative to Cognitive Behaviour Therapy: Jessica Price Explains How a Client with Low Mood and Relationship Difficulties Was Helped to Set Goals, Increase Her Motivation for Change and Re-Engage in Life," *Mental Health Practice* 17, no. 2 (October 2013): 27–33, doi:10.7748/mhp2013.10.17.2.27.e853.

⁵⁰ Kathryn Moss et al., "A Self-Help Behavioral Activation Treatment for Geriatric Depressive Symptoms," *Aging & Mental Health* 16, no. 5 (July 2012): 625–35, doi:10.1080/13607863.2011.651435.

⁵¹ Moss et al., "A Self-Help Behavioral Activation Treatment for Geriatric Depressive Symptoms".

⁵² S. Meeks, "Increasing Pleasant Events in the Nursing Home: Collaborative Behavioral Treatment for Depression," *Clinical Case Studies* 5, no. 4 (1 August 2006): 287–304, doi:10.1177/1534650104267418.

⁵³ S. Meeks et al., "Treating Depression in the Prison Nursing Home: Demonstrating Research-to-Practice Translation," *Clinical Case Studies* 7, no. 6 (17 June 2008): 555–74, doi:10.1177/1534650108321303.

⁵⁴ Adriana Yon and Forrest Scogin, "Behavioral Activation as a Treatment for Geriatric Depression," *Clinical Gerontologist* 32, no. 1 (5 December 2008): 91–103, doi:10.1080/07317110802478016.

⁵⁵ Gräsel, Wiltfang, and Kornhuber, "Non-Drug Therapies for Dementia".

⁵⁶ Götestam and Melin, "The Effect of Prompting and Reinforcement of Activity in Elderly Demented Inpatients".

change in the environment, is an important factor contributing to the return of a target reinforced behaviour back to baseline in individuals with dementia.⁵⁷

In order to implement successful behavioural interventions in nursing home settings there should be a significant intersection between Behavioural Gerontology and Organisational Behavioural Management (OBM). OBM can be defined as the “application of behavioural principles to individuals and groups in business, industry, government, and human service settings.”⁵⁸ This would suggest that if management reinforce the execution of behavioural interventions of dementia by care staff, it can potentially increase the quality and frequency at which the interventions are implemented. Findings have shown that nursing home staff are more likely to reinforce dependent behaviours than independent behaviour in residents with dementia.⁵⁹ OBM and the application of behaviourist principles in this context can highlight the potential antecedents of dependence-supportive behaviour of staff, which can be targeted via reinforcing contingencies delivered by management. Providing nursing home staff with training in communication skills, gerontology and basic behaviour principles (based mostly on shaping and reinforcement) can decrease staff dependence-supportive behaviour and increase independence-supportive behaviour.⁶⁰

The A-B-C approach has been found to be helpful when training caregivers on how to modify and manage challenging behaviour.⁶¹ That is, training caregivers to identify the target behaviour, antecedents, and consequences, and how to develop effective individualised interventions, can help modify the behavioural symptoms of dementia. This suggests that training caregivers in a behavioural intervention approach is possible and effective. A similar procedure implemented by D. Noguchi, Y. Kawano, and K. Yamanaka with nursing home staff found that during interventions, targeted dementia related challenging behaviours decreased and rate of engagement in other activities increased.⁶² However, maintenance of this modification in behaviour is dependent on the diligence of staff in implementing the interventions. For this reason it is important to offer continual support, guidance and reinforcement to nursing home staff who are implementing such strategies.

M. P. McCabe, T. E. Davison, and K. George conducted a detailed review study into the effectiveness of staff training in intervention methods concerning behavioural problems exhibited by dementia residents in nursing homes.⁶³ Their findings indicate that refresher courses are required for nursing home staff to consistently maintain the changes in resident behaviour. Manager support was identified as being a key determining factor in the

⁵⁷ Götestam and Melin, "The Effect of Prompting and Reinforcement of Activity in Elderly Demented Inpatients".

⁵⁸ Wilder, Austin, and Casella, "Applying Behavior Analysis in Organizations", 202.

⁵⁹ Elizabeth M. Barton, Margret M. Baltes, and Mary J. Orzech, "Etiology of Dependence in Older Nursing Home Residents during Morning Care: The Role of Staff Behavior," *Journal of Personality and Social Psychology* 38, no. 3 (1980): 423, doi:10.1037/0022-3514.38.3.423.

⁶⁰ Margret M. Baltes, Eva-Maria Neumann, and Susanne Zank, "Maintenance and Rehabilitation of Independence in Old Age: An Intervention Program for Staff," *Psychology and Aging* 9, no. 2 (1994): 179, doi:10.1037/0882-7974.9.2.179.

⁶¹ L. Teri et al., "Treatment for Agitation in Dementia Patients: A Behavior Management Approach," *Psychotherapy: Theory, Research, Practice, Training* 35, no. 4 (1998): 436, doi:10.1037/h0087766.

⁶² Dai Noguchi, Yoshiyuki Kawano, and Katsuo Yamanaka, "Care Staff Training in Residential Homes for Managing Behavioural and Psychological Symptoms of Dementia Based on Differential Reinforcement Procedures of Applied Behaviour Analysis: A Process Research: Care Staff Training," *Psychogeriatrics* 13, no. 2 (June 2013): 108–17, doi:10.1111/psyg.12006.

⁶³ M. P. McCabe, T. E. Davison, and K. George, "Effectiveness of Staff Training Programs for Behavioral Problems among Older People with Dementia," *Aging & Mental Health* 11, no. 5 (September 2007): 505–19, doi:10.1080/13607860601086405.

effectiveness of staff training. While management can also ensure that skills acquired are maintained in daily practice and promote the maintenance of long-term reductions in behavioural symptoms of dementia.

Conclusion

To conclude, research supports the efficacy of behavioural intervention programmes in changing the behaviour of individuals with dementia. Behavioural excess (wandering and disruptive vocalisations), behavioural deficits (incontinences & self-feeding) and mood alteration (depression) interventions have shown successful alteration of the target behaviour. The research discussed has focussed on the use of operant methods and these have been found to be viable option for individuals with dementia.⁶⁴ Intervention strategies which appear to work include CRF, DRO, prompting, token economies, timed voiding (FI), prompted voiding and bringing behaviour under stimulus control. The implementation of a behaviourist intervention requires the adherence to strict ethical guidelines as set out by the BABC, and procedures should only be used to improve the functioning or quality of life of the individual.

One of the major difficulties evident from the aforementioned studies is the maintenance of behavioural change after the intervention has been put in place. Dementia related neurocognitive decline decreases the likelihood of behavioural generalisation and requires caregivers to execute behavioural change contingencies on a continual basis to prevent the behavioural change from becoming extinguished. Specifically in nursing homes, diligence of the staff in the delivery of the behavioural interventions and level of cognitive decline of the individual are the best predictors of maintained behavioural change.⁶⁵ Staff training is suggested to be a key factor in the success of a behavioural intervention in a nursing home setting. However, evidence suggests there is no standard training or intervention strategy available for nursing home staff as of yet.⁶⁶ This is problematic as ambiguity surrounds what constitutes the most effective behavioural management training for nursing home staff. For a successful behavioural intervention to be implemented in long term care facilities, the methods need to be proven as effective and efficient, staff training requirements need to be evaluated, continual quality control of methods used need to be performed and cost-benefit ratios have to be considered.⁶⁷ Thus it has been proposed that further comprehensive research is required to determine what constitutes effective training on behavioural intervention techniques and what elements of training lead to the best results.⁶⁸

⁶⁴ Spira and Edelstein, "Operant Conditioning in Older Adults with Alzheimer's Disease".

⁶⁵ Annick Bédard et al., "Reducing Verbal Agitation in People with Dementia: Evaluation of an Intervention Based on the Satisfaction of Basic Needs," *Aging & Mental Health* 15, no. 7 (September 2011): 855–65, doi:10.1080/13607863.2011.569480.

⁶⁶ McCabe, Davison, and George, "Effectiveness of Staff Training Programs for Behavioral Problems among Older People with Dementia".

⁶⁷ Gräsel, Wiltfang, and Kornhuber, "Non-Drug Therapies for Dementia," 120.

⁶⁸ McCabe, Davison, and George, "Effectiveness of Staff Training Programs for Behavioral Problems among Older People with Dementia," 518.

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