

Journal of Clinical Gerontology & Geriatrics

www.e-jcgg.com

Review Article

Behavior management: It's impact on dementia patients and caregivers

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ABSTRACT

Behavioral and psychological symptoms of dementia (BPSD) lead to functional impairment in patients with dementia and caregiver distress. Non-pharmacological treatments of BPSD have gained increasing attention since the use of pharmacological methods has been found to be associated with negative consequences and risks. Behavioral management of BPSD is one of the non-pharmacological treatment approaches that has been utilized in psychosocial treatment programs. Behavioral strategies have also been used in the treatment of caregiver distress and depression.

This paper is based on a comprehensive search of literature in PubMed/MEDLINE and Scopus. It reviews the literature to evaluate the efficacy and utility of behavior management in helping with reduction of problem behaviors along with psychological distress in caregivers of patients with dementia. Evidence indicates that despite limitations in the studies, incorporation of behavioral management strategies into the care of patients with dementia is beneficial to caregivers as well as dementia patients.

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Received 22 June 2016

Accepted 23 August 2016

DOI:

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INTRODUCTION

Behavioral and psychological symptoms (BPSD) of dementia affects up to 90% of all patients with dementia at some point in their illness.¹ These symptoms include agitation, depression, apathy, repetitive questioning, aggression, sleep problems, wandering, psychosis and a variety of socially inappropriate behaviors.² Management of BPSD has become more complicated by the fact that risk and safety factors have been found to be associated with pharmacotherapy which has resulted in their use being limited.³ Non-pharmacological interventions have been recommended as the preferred first line management for BPSD except in emergency situations where there are imminent dangers or safety concerns.^{4,5}

Caregivers of patients with dementia are particularly impacted by the neuropsychiatric symptoms of dementia and it has been found to be associated with caregiver distress, depression and burden.^{6,7,8,9} This factor has often been implicated as the cause of early institutional placement of patients with dementia.¹⁰

Developing treatment programs that effectively target BPSD and also help with caregiver distress is a challenge. This can be more difficult in community settings where the primary caregivers are family members with diverse backgrounds. Research has indicated that nonpharmacological interventions, with multiple components, that are tailored to the needs of

the patient and delivered by caregivers are efficacious in reducing the frequency and severity of BPSD as well as caregiver distress.¹¹ Similarly interventions for reducing caregiver distress that use structured training programs in problem solving skills which include the patient as well has been found to lead to more significant benefits in caregiver distress.^{12,13}

Behavior management includes a variety of behavioral interventions, such as problem solving, communication training, cognitive restructuring, token economy and individualized behavioral reinforcement strategies.¹⁴ They typically include caregivers and utilize one or more of the behavioral strategies in a structured program. This paper examines the efficacy of behavior management in reducing problem behaviors in patients with dementia and reducing distress and burden in their care givers. It is based on a search of literature in PubMed/MEDLINE (going back to 1946) and SCOPUS (going back to 1960). The search terms used were "Dementia/psychology" "Dementia/therapy", "Behavior Therapy" "Behavioral Symptoms", "Behavior Management", "Caregivers" "Nursing Staff" "Randomized Controlled Trial" "Systematic review" and "Meta-Analysis". The studies included: (i) were randomized controlled trials (ii) utilized behavior management strategies to modify BPSD (iii) utilized behavior management strategies to modify BPSD and also caregiver distress or depression.

Table 1. Summary of Studies of Behavior Management directed at Problem Behaviors of Dementia Patients

Study	Number of Subjects	BM Strategies	Assessment Tools	Intervention Length	Follow up	Improvements in DS & CGS
Teri et al., 1997 ¹⁵	72 CGS & DS	- Problem solving based on ABC paradigm. - Increase in behavioral activation (using pleasant activities)	HDRS CSDD BDI ZBI	9, 1 hour sessions over 9 weeks.	At 6 months	- Significant improvement of depression in DS - Significant improvement of depression in CGS
Gormley et al., 2001 ¹⁶	62 CGS & DS	- Functional analysis based problem solving for aggressive behaviors.	RAGE BEHAVE-AD ZBI	4 sessions (length of session not mentioned) over 8 weeks.	Nil	- Trend towards reduction in aggressive behaviors noted
Huang et al., 2003 ¹⁷	59 CGS & DS	PLST and ABC paradigm based problem solving	CMAI AMSS	2 training sessions lasting 2 to 3 hours each and 2 weekly consultation calls over a total period of 4 weeks.	At 3 months & At 4 months.	- Behavior problems in DS - Self efficacy in CGS
Huang et al., 2013 ²¹	129 CGS & DS	PLST and ABC paradigm based problem solving	CPS CS AMSS PAB Sub-scale of CMAI	2 training sessions lasting 2 to 3 hours each over 2 weeks and monthly consultation for 6 months.	At 3 months & At 6 months	- Behavior problems in DS - Aggressive behavior probability - Better preparedness, competence and self-efficacy in CGS
Stanley et al., 2013 ²²	32 CGS & DS	Peaceful Mind, a CBT based intervention for anxiety	NPI RAID PSWQ GAI GDS QOL-AD	12 weekly sessions for 3 months and up to 8 brief telephone calls after that till end of 6 months	At 3 months & At 6 months	- Anxiety rated less by clinicians. - Less distress in CGS in relation to DS anxiety
Spector et al., 2013 ²³	50 CGS & DS	CBT for anxiety adapted for DS	RAID CSRI HADS QOL-AD NPI CSDD QCPR	10 sessions over 15 weeks	At 15 weeks & At 6 months	- Anxiety in DS showed decreasing trend. - Depression in DS
Teri et al, 2005 ²⁵	25 Assisted Living facility staff 31 DS	- Problem solving based on ABC paradigm. - Interaction pattern or communication skills	GDS CAS RMBPC ABID NPI SSCQ	8 weeks	6 months	- Problem behaviors in DS - Depression in DS - Anxiety in DS - Job satisfaction in CGS - Less adverse impact and reaction by CGS to DS problem behaviors

BM, Behavior management; DS, Dementia subjects; CGS, Caregiver subjects; HDRS, Hamilton Depression Rating Scale; CSDD, Cornell Scale for Depression in Dementia; BDI, Beck Depression Inventory; ZBI, The Zarit Burden Inventory; BEHAVE-AD, Behavioral Pathology in Alzheimer's Disease Rating Scale; RAGE, The Rating Scale for Aggressive Behavior in the Elderly; CMAI, Cohen-Mansfield Agitation Inventory; AMSS, Agitation Management Self-efficacy Scale; CPS, Caregiver Preparedness Scale; CS, Competence Scale; PAB, Physically aggressive behaviors subscale; NPI-A, Neuropsychiatric Inventory-Anxiety subscale; RAID, Rating Anxiety in Dementia Scale; PSWQ, Penn State Worry Questionnaire-Abbreviated; GAI, Geriatric Anxiety Inventory; GDS, Geriatric Depression Scale; QOL-AD, Quality of Life in Alzheimer's Disease; PHQ9, Patient Health Questionnaire; CSRI, Clinical Services Receipt Inventory; HADS, Hospital Anxiety and Depression Scale; QCPR, Quality of Caregiver and Patient Relationship; CAS, Clinical Anxiety Scale; RMBPC, Revised Memory and Behavior Problems Checklist; ABID, Agitated Behaviors in Dementia; SSCQ, Short Sense of Competence Questionnaire.

Table 2. Summary of studies of behavior management directed at problem behaviors of patients with dementia and wellbeing of caregivers

Study	Number of Subjects	BM Strategies	Assessment Tools	Intervention Length	Follow up	Improvements in DS & CGS
Burgio et al., 2003 ²⁷	140 CGS & DS	<ul style="list-style-type: none"> - Problem solving - Cognitive restructuring for CGS 	RMBPC PAC LSNI CES-D	Three hour workshop followed by 16, 1 hour intervention sessions for 12 months	Nil Assessments were made at 6 month point of treatment	<ul style="list-style-type: none"> - Reduced problem behaviors in DS - CGS distress - Leisure activity satisfaction in CG.
Hebert et al., 2003 ²⁸	158 CGS	<ul style="list-style-type: none"> - Group format and psycho educative with CGS being taught behavior management skills - Problem solving based on ABC paradigm - Cognitive reappraisal - Cognitive reframing - Seeking social support 	RMBPC ZBI SSTAI BRAS	15, 2 hour weekly sessions for 15 weeks	Nil	<ul style="list-style-type: none"> - Problem behaviors in DS improved but did not reach significance - CGS desire to institutionalize DS - CGS reactions to problem behaviors of DS
Gonyea et al., 2006 ³¹	80 CGS	<ul style="list-style-type: none"> - Group format and psycho educative with CGS being taught behavior management skills - Problem solving based on ABC paradigm for DS behavior problems - Behavioral activation to increase pleasant activities for DS - Strategies to reduce stress for CGS, e.g. relaxation exercise - Increasing pleasant activities for CGS 	RMBPC ZBI SSTAI BRAS	90 minute weekly sessions for 5 weeks	Nil	<ul style="list-style-type: none"> - Problem behaviors in DS improved but did not reach significance - CGS reactions to problem behaviors of DS
Moniz- Cook et al., 2008 ³²	113 CGS & DS	<ul style="list-style-type: none"> - Problem solving based on ABC paradigm - Stress coping for CG 	RMBPC ZBI SSTAI BRAS	Intervention period of 18 months. 4 weekly intervention home visits. Further visits based on clinical judgment	Nil Assessments were carried out at 6, 12 and 18 months, during the treatment period	<ul style="list-style-type: none"> - Problem behaviors of DS. - Depression in CGS - Anxiety in CGS
Gitlin et al., 2010 ³⁴	272 CGS & DS pairs	<ul style="list-style-type: none"> - Problem solving based on ABC paradigm 	Frequency of problem behaviors CG upset on scale of 0 to 10 CG confidence on scale of 0 to 4 CES-D ZBI	Eleven home/telephone contacts (length of contact time not mentioned) over a period of 16 weeks	Two months	<ul style="list-style-type: none"> - Problem behaviors of DS - Depression in CGS - Distress and burden in CGS - CGS skills in managing problem behaviors of DS

BM, Behavior management; DS, Dementia subjects; CS, Caregiver Subjects; RMBPC, Revised Memory and Behavior Problem Checklist; PAC, Positive Aspects of Caregiving; LSNI, Lubben Social Network Index; CES-D, Center for Epidemiological Studies-Depression Scale; ZBI, Zarit Burden Inventory; SSTAI, Spielberger State-Trait Anxiety Inventory; BRAS, Bradburn Revised Affective Scale; ISSB, Inventory of Socially Supportive Behavior; IPSI, Ifield Psychiatric Symptoms Index; NPI, Neuropsychiatric Inventory; GHQ-3, General Health Questionnaire; GPC, Gilieard Problem Checklist; HADS, Hospital Anxiety and Depression Scale; PCI-Perceived Change Index.

Behavior Management directed at Problem Behaviors in Patients with Dementia

A number of randomized controlled trials (RCT) have been carried out which have involved training caregivers in the application of behavioral strategies to reduce problem behaviors in patients. Some of the studies have also examined the impact of the behavioral training on caregiver well-being. Teri et al developed the community based Seattle protocol which involves training caregivers in the behavioral approach in problem solving using the ABC (antecedent-behavior-consequences) paradigm and the application of strategies to improve mood of patients. In an initial study the two behavioral interventions were compared for efficacy to an equal duration care condition and a wait list control condition.¹⁵ Patients and caregiver pairs were assigned to one of the four conditions and assessed at pre and post treatment and again at 6 month by interviewers blinded to treatment assignment. Caregiver depression and burden was also assessed. Seventy two patient- caregiver pairs completed the study. Patients in both behavioral conditions showed significant improvement, in depression symptoms which was maintained at 6 months. Caregivers in the two behavioral management conditions also showed significant improvement in their own depressive symptoms while those in the other two control conditions did not. This study highlights the fact that although the intervention did not target the caregivers directly it resulted in significant reduction of caregiver depression levels. It is likely that the increased skill in patient management and the improved depression in the family member accounted for the positive caregiver results.¹⁵ Despite the small sample size, aspects of the study such as blinded interviewers, randomization and control conditions add significance to the study findings.

Gormley et al.,¹⁶ carried out a RCT to evaluate the efficacy of a four session community based behavior management training program for family caregivers which targeted aggressive behaviors in 62 patients with dementia. The training program consisted of dementia education and training of caregivers in functional analysis based behavioral interventions targeting care recipient's aggressive behaviors. The control group had a similar number of sessions with discussions on care related issues. Post treatment assessment was carried two weeks after the intervention by a researcher blinded to group assignment. No significant differences in aggression scores were found between behavior management and control groups but adjusting for baseline differences indicated a trend towards a reduction in aggressive behavior in the behavior management group. There was no significant difference in caregiver burden. The relatively small sample size and brief behavioral program could account for the limited reduction of aggressive behaviors in the patients. However the complex nature of aggression in dementia which is an interaction of the neurobiological, environmental and psychological factors could also have contributed to the modest results.

Huang et al., carried out a RCT on 59 family based care givers in the community utilizing an intervention program which involved functional analysis to help identify negative

environmental stressors that could be triggering problem behaviors and provision of appropriate environmental support.¹⁷ The intervention based on the Progressively Lowered Stress Threshold Model (PLST) was tailored to the individual needs of the caregivers in the community.^{18,19,20} The intervention consisted of two in-home care giving training sessions, followed by weekly telephone consultations for two weeks. The training sessions included a thorough assessment of the patient, their environmental safety and stimuli. The investigator worked with the caregiver to identify target behaviors and developed plans of action based on the PLST model. The weekly phone calls evaluated progress and further guidance was provided. The control group received educational materials and social telephone follow-ups every two weeks. Follow up evaluations carried out in the third and fourth month indicated that in the case of the experimental group there was significant improvement in caregivers' self-efficacy in managing behavior problems and in the number of the problem behaviors in the dementia subjects. The physically aggressive behaviors showed a decreasing trend but did not reach significance. The results of this RCT indicate positive outcomes for both the patients and their caregivers. Larger sample size and longer period of program application and follow up would have been helpful to determine if the benefits were maintained or even improved more over time in the treatment group.

Huang et al., carried out a second study along the same lines as his earlier study but had follow up consultations for a longer period of 6 months.²¹ It was a single blinded RCT with 129 caregiver and patient dyads to examine the efficacy of the individualized, home-based training program. The control group received written educational materials and social telephone calls. The training program was guided by the Progressively Lowered Stress Threshold (PLST) model and the Antecedent Event-Behavior-Consequence Analysis (ABC) theory. The training program for the treatment group consisted of two sessions of training by research nurses which was followed by monthly consultations for 6 months. Assessments were made for patients' behavioral problems and caregiver preparedness, competence, and self-efficacy in managing behavioral problems at baseline and then at 2 weeks, 3 months and 6 months after the program was completed. The program resulted in significant reduction of overall problem behaviors and the probability of physically aggressive behavior for patients in the intervention group decreased from 0.27 to 0.12. Family caregivers who received the training were found to have better preparedness, competence and overall self-efficacy at 3 months than those in the control condition. The growth rate by treatment interaction effect was significant for caregiver competence and overall self-efficacy for managing behavioral problems. The study has some limitations, such as, the outcome variables being reported by the caregivers and same research nurse who carried out the intervention also being involved in the outcome assessment. However this study has demonstrated that an ABC paradigm and PLST based behavior management program carried out for a period of 6 months can decrease physical aggressiveness in the home setting. This has been reported in studies conducted in

institutions and rarely reported in community based programs.¹⁷

Stanley et al., carried out a pilot RCT to test the efficacy of Peaceful Mind, a Cognitive Behavior Therapy (CBT) based intervention program for anxiety in 32 patients with mild or moderate dementia.²² Modifications were made from standard CBT, such as simplified materials, collaterals, more repetition and practice protocol, to accommodate the needs of patients with dementia. The intervention included up to 12 weekly in-home sessions for 3 months and up to 8 brief telephone sessions. In the control usual care condition the patients received diagnostic feedback. Evaluators blinded to intervention assignment carried out outcome assessments. Measures were administered at baseline, 3 months and 6 months. At 3 months clinicians rated patients receiving Peaceful Mind as less anxious, and patients rated themselves as having higher quality of life; collaterals reported less distress related to loved ones' anxiety. However, no positive effects were noted on patient self-reported worry, anxiety, or depression or on collateral depression. There was no change in results at the 6 month point of the intervention. The lack of positive results on the self-report measures may be linked to the basic problem of self-reporting in patients with dementia, while the lack of reduction in collateral depression could have been because there was a relatively low level of depression in this sub-group to start off with. In addition the collaterals were not always the primary caregivers and there was considerable variability amongst them in the amount of time spent with the care recipients. The fact that there was no positive impact at 6 months may also indicate a need for a longer intervention period.

Spector et al., also carried out a pilot single blind RCT to evaluate the efficacy of a modified CBT protocol for anxiety in patients with mild to moderate dementia.²³ The protocol was based on Beck and Clark's cognitive model of anxiety.²⁴ The caregivers played a role in supporting the patients in implementing the CBT strategies. Fifty patients were randomly assigned to CBT plus treatment as usual and treatment as usual condition. Assessments were carried out by research assistants at baseline, 15 weeks (end of treatment) and at 6 months follow up in the area of anxiety, depression, behavioral disturbances, and cognitive functions of dementia patients. Additional assessments were made in both the patient and caregiver in the areas of anxiety and depression, quality of life and patient caregiver relationship. At 15 weeks there was a reduction in anxiety in the patients which came close to significance and was maintained at 6 months. There were significant improvements in depression and it remained significant at 6 months. There were no significant results in any of the other areas for the patient or the caregiver. This study like the study by Stanley et al.,²² is a pilot study and shows promise but requires a larger study to determine efficacy.

Teri et al., carried out a study in assisted living facilities where the staff was trained in the application of behavioral strategies to manage behavior problems exhibited by patients with dementia.²⁵ Four assisted living residences were randomly assigned to the behavioral program and usual on-site routine training which included general

information on the needs of older adults and how to work with memory impaired residents. The training for the intervention group emphasized teaching staff the ABCs (activators, behaviors, and consequences) of behavioral distress in order to alter the sequence of events that initiate or maintain resident-care problems. It also emphasized the staff's interaction with the resident. Post training, residents in assisted living settings where the staff received the training showed clinical and statistically significant improvement which was reflected on measures of resident behavior problems, depression, and anxiety; residents in control conditions did not show improvement but in fact deteriorated. Staff with behavioral training reported higher job satisfaction and significantly less adverse impact and reaction to residents' problems. The improvements were maintained at the six month follow up. The positive findings in this study with limited power is encouraging and indicates the feasibility of training staff in assisted living facilities to manage and care for patients with dementia (many of whom live in assisted living facilities in the earlier stages of the disease), using effective behavioral treatment strategies.

Behavior Management Directed at Problem Behaviors in Patients with Dementia as well as Caregiver Wellbeing

Teri et al., studied the outcome and impact of their behavior management program in another RCT where 95 family caregivers and care recipients with Alzheimer's disease were assigned to either the behavioral program or the control condition of routine medical care.²⁶ Behavior management consultants consisted of a diverse group of health care professionals who were provided training in the behavioral program. The consultants met with caregivers in their homes for 8 weekly sessions, followed by 4 monthly phone calls. The initial sessions focused on teaching caregivers the rationale and use of the A-B-C problem solving approach using examples of behavior problems the caregivers had faced. Later sessions focused on increasing pleasant events, improving caregiver communication and increasing care giver support. The monthly phone calls continued to build on the training and also supported caregivers in developing plans and strategies for new problems they faced. Masked interviewers conducted assessments at baseline, after treatment, and after 6 months.

The results indicated that there were significant reductions in the frequency and severity of care recipient problem behaviors and improved quality of life. The caregivers showed significant improvement in depression, burden and reactivity to behavior problems in the care recipient. The improvement was maintained at the 6 month follow up. The study indicates that community consultants can be trained to implement behavioral interventions with caregivers and the outcome is positive for both the care recipients and care givers at the six month follow up. However, examining the level of ongoing supervision would have been useful to determine the level of supervision required to maintain the impact. Another important aspect of such a program if it is to be applied for long periods of time is to take into consideration factors needed to ensure

that intervention integrity is maintained, especially as there is decline in the patients' functioning.

Burgio et al., developed a manualized intervention involving functional analysis, problem solving, communication skills and cognitive restructuring which was delivered to 70 caregivers in the experimental group through workshops and in home training sessions.²⁷ Another 70 caregivers were placed in a minimal support control condition involving brief supportive phone calls and generic educational materials. The intervention consisted of a 3 hour workshop, followed by 16 in-home treatment sessions over a 12 month period and therapeutic phone calls between home visits. The sessions were aimed at providing information and developing caregiver skills in the area of behavior management techniques. It also involved teaching care givers skills of applying problem solving to themselves to increase pleasant events, enhance social support and self-care. Cognitive restructuring was utilized to encourage more benign appraisals of behavior problems and to find meaning and personal gain where possible. The assessments were carried out at the 6 month point of the intervention and the results indicated that both interventions had a significant impact on caregiver distress since both groups of caregivers reported being less distressed by the problem behaviors and also increased satisfaction with their leisure activities. Both interventions also resulted in reduced problem behaviors in the two groups. The investigators took into consideration the race of the subjects and found that the Caucasians responded better to the minimal support condition and the African Americans responded better to the skills training condition. Differential responses were also linked to whether the caregivers were spouses or not. The results support the beneficial impact of the behavior management program on the patients and the caregivers although the authors were unable to blind the study personnel to group assignment. This is a problem in psychosocial interventions and worth addressing. This study also draws attention to the need to take into consideration other factors such as race, culture and relationship to care recipient during the planning and application of interventions. An assessment at the end of the 12 month period of treatment and also a further follow up assessment would have been useful to ascertain the durability and impact of the intervention over a longer period of time.

In another multi-center RCT 158 caregivers were randomized to the intervention and control groups in 12 successive waves.²⁸ While the control group attended the traditional support groups the intervention group attended the psycho educative program developed by Folkman et al.,²⁹ extended over 15 two-hourly weekly group sessions. The program consisted of two main components. The first component targeted improving cognitive appraisal of problem situations so that they shifted appraisal from a global stressor appraisal to a more specific appraisal of the stressor. Caregivers were encouraged to distinguish between changeable and unchangeable aspects of the stressor, leading to a better choice of coping strategies. The second component which was the coping component focused on the strategies of problem solving, reframing and seeking social support. With regard to problem solving, caregivers were

taught the steps that have to be taken to clarify a target behavior that was changeable, utilizing behavioral techniques and finding an appropriate solution to help reduce the frequency and intensity of the problem behavior. The reframing strategy involved training caregivers to recognize their dysfunctional thinking and work on modifying them so that the emotional distress associated with the dysfunctional thinking reduces.³⁰ A third coping strategy consisted of care givers seeking social support. Assessments were carried out at baseline and at the end of the intervention period by assessors who were blinded to group placement. Results indicated that the intervention resulted in a significant reduction in the caregiver reactions to disruptive behaviors. There was also a reduction of behavior problems reported by the caregivers in the intervention group with the difference between the study and control group approaching significance. This RCT has shown significant benefits to the caregivers using a cost effective group approach. Their improved coping was also reflected in the significantly lesser desire to institutionalize the dementia subjects as compared to the control group. The positive trend of reduction in behavior problems in the patients with dementia is encouraging and it is possible that a longer intervention period may have produced improved and significant results. Similarly a follow up assessment after 6 months or more would have also provided more insight into the durability of the treatment. The findings may also indicate that the method of intervention delivery, that is, a purely group format may be less effective.

Gonyea et al., carried out a RCT with 80 caregivers which involved group training sessions for caregivers in the experimental group in a multi-component behavioral intervention extending over 5 weeks.³¹ The intervention was aimed at reducing problem behaviors in patients with dementia, care giver distress and burden. It involved training caregivers in functional analysis and behavioral activation. Increasing caregivers' and care recipients' involvement in pleasant activities was an important component and caregivers were also guided on strategies to manage their own distress. The control group received a similar period of group psycho education. The outcome results based on assessments at the end of the intervention and six weeks after baseline assessment indicated that the training resulted in significant reduction in caregiver distress associated with problem behaviors but there was no reduction in global burden. There was a trend in the direction of greater reductions of problem behaviors in patients but it did not reach significance. The assessors however could not be blinded to the intervention condition at the post intervention assessment. This RCT is nevertheless important since it suggests that a brief cost effective targeted group intervention based on the principles of behavior therapy can be beneficial for caregivers and care recipients.

A RCT was carried out in the United Kingdom with 54 experimental and 59 control families who provided care to individuals with dementia living at home over a period of 18 months.³² The care givers in the experimental group were given guidance by trained community mental health nurses (CMHN) in problem solving and stress-coping. The CMHN

conducted the intervention over four consecutive weekly in-home visits. Subsequent visits were based on clinical judgment. The CMHN had clinical supervision throughout the 18 month period of the study. The control group received care as usual from the community mental health nurses. Assessments were carried out at 6, 12 and 18 months. Results indicated that while cognition declined in all the dementia subjects the problem behaviors reduced in the experimental group and the mood of the caregivers showed improvement at 12 months and 18 months. The control group on the other hand reported increased problem behaviors in the patients, reduced coping resources and worsening of depression in the caregivers. The eighteen month period of intervention with assessments at intervals is an important strength of this study. Improvement in caregiver mood was seen much later at 12 months and it was maintained at 18 months. It is possible that the intervention being less intensive after the initial 4 weeks had a role to play in the slower improvement which was nevertheless maintained at 18 months. It has also been suggested that behavior management delivered over a longer period of time can be protective and prevents mood deterioration³³ which was seen in this study. Attrition and inadequate protocol adherence by the CMHN were some of the problems associated with the study.

Gitlin et al., carried out a RCT on 272 caregivers and dementia subjects where the caregivers in the experimental group had up to 11 home/telephone contacts over a period of 16 weeks by health professionals.³⁴ The problem behaviors were conceptualized as being a consequence of interacting factors which could be patient based (unmet needs, discomfort/pain, incipient medical condition), caregiver-based (stress, communication style) and environment-based (clutter, hazards). The training helped caregivers to develop the skills to identify and eliminate, reduce or prevent the problem behaviors. The control group received no intervention. There was significant reduction of problem behaviors in the patients at the end of the intervention at 16 weeks and again at 24 weeks. Results indicated improved caregiver skills in managing the problem behaviors in the patients as well as decreased depressive symptomatology, burden and upset with problem behaviors overall. Caregiver benefits were noted at 16 weeks and again at 24 weeks. In the case of the caregivers in the control group there was a worsening in their wellbeing and their management abilities. This study utilized a targeted approach using a targeted measurement as well as intervention so that they identified and treated problem behaviors that was most salient to the caregivers. This approach is in keeping with a client centered and individualized approach which enhances intervention efficiency. However a longer period of intervention is likely to have been more effective as indicated by the fact that there was a trend showing improvement in communication at the end of the intervention but it did not reach significance at 24 weeks. Similarly, depression in caregivers showed significant improvement at 16 weeks but failed to reach significance at 24 weeks. Longer period of follow up assessments would have also been useful in bringing to light long term outcomes and durability of the treatment program.

DISCUSSION AND CONCLUSION

Almost all the studies reviewed have incorporated functional analysis or the ABC paradigm of problem solving as one of the strategies in the multi-component behavior management programs. The other strategies that were incorporated included behavioral activation and improving communication skills of caregivers. In the studies where the behavior management training programs incorporated training for caregivers in order to improve their well-being, cognitive restructuring, increasing pleasant activities and seeking of social support were used.

The length and number of training sessions, follow up consultation, format of training, and assessment tools has varied from study to study. Studies that have used a greater number of training and follow up/consultation sessions have reported better results. For example, Gromley et al., used a 4 session behavior management program which did not produce a significant reduction in the problem behavior targeted and also in caregiver burden.¹⁶ Significantly better results were reported by Huang et al.,²¹ when the training sessions were followed by monthly consultations for 6 months versus follow up consultations for only two weeks.¹⁷ This is in keeping with earlier reports that successful interventions of BPSD have typically utilized more than 6 sessions or 9 to 12 intervention sessions.^{35,12} Studies that have used a group format for training the caregivers in behavior management have been noted to not be as effective in reducing BPSD or improving caregiver well-being.^{28,31} This fits in with the fact that dyadic interventions involving the patients and their caregivers have been reported to be important in bringing about positive results for BPSD^{36,12} and this could explain the reduced efficacy of the group format.

In the studies that focused on the BPSD alone some of the studies also found that it had a beneficial impact on the caregivers. The studies have assessed different areas of caregiver well-being and some reported increased caregiver efficacy in managing the problem behaviors,^{17,21} reduced depression,¹⁵ and distress associated with the BPSD.^{22,25} Others have found that there was no change in areas like depression,^{22,23} burden¹⁶ and quality of life.²³ In the studies that focused on both the patients and also the caregivers all the studies reported benefits for the caregivers, such as reduced distress,^{27,32,34} burden,³⁴ depression,^{32,34} leisure activity satisfaction,²⁷ reduced adverse reactions to the BPSD,^{28,31} and reduced desire to institutionalize the patient.²⁸ Factors, such as the dyadic format of sessions with caregiver and patient, sufficient number of intervention sessions and follow up consultations as well as individualized planning and application of strategies are all factors that have been noted to contribute to beneficial outcomes for both patients and caregivers.

Treatment of behavior problems in Dementia is complex because of the progressive nature of the disease and the fact that the behavior problems have at their core the declining efficacy of brain functions. The problem behaviors can also be triggered and/or exacerbated by the physical as well as the psycho-social environment. As such the psycho social intervention for BPSD will need to be

individualized and modified depending on the different stages of the disease and also the setting in which the patient resides. The typical management of the dementia patient is multi-faceted and a variety of treatment strategies have to be utilized. The research in the area of behavior management despite limitations shows promise as a useful and effective intervention which can be incorporated in the care of patients with dementia and also their caregivers at the same time.

CONFLICT OF INTEREST STATEMENT

No conflict of interest was declared among authors.

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