

# Master of Clinical Science

A systematic review of appropriateness and effectiveness of management strategies used for the Behavioural and Psychological Symptoms of Dementia in the residential care setting.

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THE JOANNA BRIGGS  
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# Abstract

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## **Background**

The incidence of dementia is increasing throughout the world. People with dementia often require residential care. The management of behaviours in residential care is a significant and stressful part of caring for people with dementia. The ability to apply appropriate and effective management strategies to these behaviours is vital to maintain the safety of the person with dementia and the people who live with them and care for them.

## **Objectives**

The aim of this review is to identify and synthesise the best available evidence of the appropriateness and effectiveness of different strategies used to manage the behavioural and psychological symptoms of dementia in the residential care setting.

## **Inclusion criteria**

### *Types of participants*

Adults aged 65 years and older regardless of gender, ethnicity, co-morbidities who reside in a residential care facility. The subjects must have a diagnosis of dementia and exhibit behaviours which require a degree of modification or management so that they can be safely managed in a residential care facility.

### *Types of interventions/Phenomenon of Interest*

Interventions types examined in this review were: Standard behavioural therapies, Alternative therapies, Complementary therapies, Psychotherapies, Environmental factors, Pharmacological interventions.

### *Types of studies*

This comprehensive review considered both qualitative and quantitative studies. Included quantitative studies were randomized control trials, case control and cohort studies. The qualitative studies focused on the experiences of the people with dementia and the people who care for them.

### *Types of Outcome Measures*

There was a wide range of outcome measures in the selected studies. The outcome strategies focused on both prevalence and severity of behaviours to illustrate effectiveness of interventions.

### *Search Strategy*

Both published and unpublished English language studies were considered, from inception of the eight databases searched up to March 2012. A three-step search strategy was utilized in each component of this review.

### *Methodological quality*

20 papers were assessed for methodological quality by two independent reviewers, using standardised Joanna Briggs Institute instruments. Of these papers, two were qualitative and the remaining 18 were quantitative through this process studies were considered to be of moderate to high quality as assessed against the Joanna Briggs critical appraisal tools. No studies were excluded based on methodological quality.

### *Data Collection and Data Synthesis*

Data was extracted using standardized data extraction tools. Meta-analysis of quantitative data was appropriate for two of the studies, it was not attempted on the others due to lack of clinical and statistical heterogeneity; therefore findings are presented as a narrative. Meta-aggregation of qualitative findings was conducted in order to generate synthesised findings.

## **Results**

20 papers were identified for this systematic review. 18 of these papers were quantitative and two were qualitative. These papers described effective and appropriate management of the behavioural and psychological symptoms using a variety of methods, pharmacological and non-pharmacological.

## **Conclusion**

Effectiveness in management of behavioural and psychological symptoms of dementia is dependent on correct diagnosis of the behaviour and the detection of underlying pathology organic or psychiatric. Interventions need to be targeted at the resident and based on the residents lived experiences.

# Student declaration

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This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution to Matt Kowald and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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Signed:

Matt Kowald

Dated:                    /            /2013



# List of Abbreviations

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|                 |   |
|-----------------|---|
| ABMI.....       | Agitation Behaviour Mapping Instrument  |
| ACTUARI .....   | Analysis of Cost, Technology and Utilization Assessment and Review Instrument |
| BEHAVE-AD ..... | Behaviour Pathology in Alzheimer's disease Rating Scale                       |
| BPSD.....       | Behavioural and Psychological Symptoms of Dementia                            |
| BMS.....        | Behavior Measurement scale  |
| CGIC.....       | Clinical global impression of change  |
| CI .....        | Confidence interval   |
| CMAI .....      | Cohen Mansfield Agitation Inventory   |
| CReMS.....      | Comprehensive Review Management System  |
| EPS.....        | Extra-pyramidal symptoms  |
| FAST.....       | Functional Activity Staging Test  |
| GDS.....        | Global Deterioration Scale  |
| MAI.....        | Medication appropriateness index  |
| MAKS.....       | Multimodal or multi component therapy   |
| MAStARI.....    | Meta Analysis of Statistics Assessment and Review Instrument                  |
| MCMI.....       | Modified Cohen Mansfield Agitation Inventory                                  |
| MeSH.....       | Medical subject headings  |
| MMSE .....      | Mini Mental State Exam  |
| M-NCAS.....     | Modified Nursing Care Assessment Scale  |
| NBRS.....       | Neurobehavioral rating scale  |
| NHBPS.....      | Nursing home behavioral problem score   |

NOSGER.....Nurses Observation Scale for Geriatric Patients  
NOTARI.....Narrative Opinion and Text Assessment and Review Instrument  
NPI.....Neuro-Psychiatric Inventory  
NPI-NH.....Neuro-psychiatric Inventory Nursing home version  
PSMS.....Physical Self Maintenance Scale  
QARI ..... Qualitative Assessment and Review Instrument  
RACF ..... Residential Aged Care Facility  
RUD-FOCA.....Resource Utilization in Dementia – Formal Care  
TREA.....Treatment Routes for Exploring Agitation  
UKU.....Udvalg for Kliniske Undersogelser

# Chapter 1 Introduction

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## **1.1 Introduction to comprehensive systematic reviews of effectiveness and appropriateness in healthcare**

This chapter aims to introduce the reader to the development of the systematic review and the flow of this thesis. It also attempts to give an appreciation of the methodology and process of the systematic review to validate the research undertaken. This chapter also outlines the need for such a review and gives some context to a discussion around effectiveness and appropriateness both in the area of the Behavioural and Psychological Symptoms of Dementia (BPSD) in residential care and more broadly, in systematic reviews in general.

## **1.2 The structure of this thesis**

This thesis made up of six chapters. Chapter one aims to give an introduction to the systematic review process and the published reviews into effectiveness and appropriateness of BPSD. Chapter two focuses on dementia and describing the BPSD and the residential care environment. Chapter three presents the systematic review protocol as accepted and published by the Joanna Briggs Institute from which this thesis developed. Chapter four presents results of the search for studies. This chapter then goes on to look at the methodological quality of the quantitative and the qualitative studies identified. It also explores the findings from the quantitative and the qualitative studies. Chapter four concludes with a meta-synthesis of the qualitative papers and the meta-analysis of the appropriate quantitative papers. Chapter five discusses the findings as they relate to the six identified areas of enquiry from the systematic review protocol, the limitations of this study and the methodological issues experienced in the process of conducting this review. Chapter six offers conclusions drawn from findings and gives recommendations for research and practice. The thesis is completed with a list of references, acknowledgements of assistance received in the course of completing this thesis and appendices.

## **1.1 Situating this review**

This review examines the evidence both qualitative and quantitative in the area of managing effectively and appropriately the behavioural and psychological symptoms of dementia in the context of the residential care facility. Dementia and BPSD will be explored further in chapter two. This systematic review is appears to be the first of its kind in that it looks exclusively at studies conducted in residential care facilities. It is also looks at a broad range of management strategies; it does not focus on any particular symptom or behaviour exhibited in people who have dementia. This systematic review has not been funded or supported by a government organization or an interest group from the subject area. This lack of external interests has resulted in a review and a thesis that has no other agenda but to inform practice.

As a clinician this review was necessary and it is important in establishing a list of recommendations for the general management of BPSD in the context of residential care. It also gives some priorities in the area of research and policy direction for the area of aged care and health care for persons with BPSD.

## **1.2 An introduction to systematic reviews**

The systematic review aims to answer questions. In an age where there is an overwhelming barrage of information, the systematic review aims to filter that information and give it greater power to answer questions. The ability of every aspect of health care to be researched with the gold standard randomized control trial is impossible<sup>[1]</sup>; not only from the practical and economic points of view but also some areas and questions that are better answered by other methods. The Joanna Briggs Institute uses systematic review methodologies as a way of assembling the best evidence to inform practice on a variety of health care issues and practices<sup>[2]</sup>.

This process of systematic review involves utilizing a scientific process by developing a protocol or an experiment on which this line of enquiry is based<sup>[3]</sup>. This protocol is a transparent scientific process which clearly outlines the parameters of the question asked and the context to which

the enquiry is based. The systematic review is a systematic trawling of literature in this case primary studies both published and unpublished<sup>[4]</sup>. The search terms are trialled and determined so to give the most representative works in the area of study. This search is detailed and reproducible. The studies identified in this searching process are then scrutinized to ensure that they are indeed the papers that will answer the research question through abstract analysis and then full text analysis<sup>[2]</sup>. The papers that meet the criteria for review then undergo a critical appraisal process of the methodologies used in each of the studies conducted using a primary and secondary reviewer who has been trained in the assessment of research methodology<sup>[2]</sup>. The critical appraisal process looks for areas of bias or factors which may confound the results of the primary studies. The critical appraisal process also ensures that the papers are of high enough methodological quality that the results can be trusted and relied upon to inform the reader<sup>[5]</sup>. The tools for critical appraisal tools are specified by the Joanna Briggs Institute and are presented in Appendix iv<sup>[2]</sup>. These tools are available from the Joanna Briggs Institutes as part of the, system for unified management and assessment and review of information known as SUMARI software<sup>[6]</sup>. As part of the SUMARI program there is the Comprehensive Review Management System (CRMS) module which assists the in the organization and presentation of the systematic review<sup>[2]</sup>. The SUMARI program also includes critical appraisal tools, Qualitative Assessment and Review Instrument (QARI) which was used for this review with Meta Analysis of Statistics Assessment and Review Instrument (MAStARI) the instrument for apprising quantitative studies<sup>[6]</sup>. SUMARI also has available Narrative Opinion and Text Assessment and Review Instrument (NOTARI)<sup>[6]</sup> for the appraisal of text and opinion papers and Analysis of Cost, Technology and Utilization Assessment and Review Instrument (ACTUARI) for the assessment of economic impact studies<sup>[6]</sup>, however these modules were not utilized in this review.

After the critical appraisal process, data extraction is then undertaken and data synthesis follows where appropriate, quantitative data is combined in meta-analysis in order to generate a statistical summary of the included studies. Findings from qualitative research can be combined in meta-synthesis. The Joanna Briggs Institute approach is to use meta-aggregation in order to generate a summary of findings extracted from the included studies. This data is then presented and expressed in answer to the original questions. Of course these answers then go on to assist in the informing of practice and further research. The systematic reviewer provides a concise appraisal of the evidence and prevents duplication of effort for both clinicians and

researchers alike<sup>[7]</sup>. With limited funding for primary research in all fields, the systematic review allows the combination of multiple studies with similar methodologies and aims to give a greater level of credibility to the overall results of the studies<sup>[8]</sup>.

My decision to conduct a systematic review was based on the existence of what I felt was reliable evidence in the area of BPSD. This evidence needs to be applied in the provision of care in the residential care setting. The decision then to make this a comprehensive systematic review was born from the need to evidence both effectiveness and appropriateness of interventions used in the management of BPSD. In reviewing the literature it was decided that it was not possible to look at quantitative or qualitative studies exclusively, as the experience of the resident or worker in a facility was just as important as the application of an intervention and its effectiveness.

### **1.3 Effectiveness and appropriateness**

The term effectiveness, as defined by the Joanna Briggs institute, refers to the effect of a particular treatment or intervention, drug or procedure on defined outcomes when used in actual practice<sup>[2]</sup>. The term appropriateness is defined as, suitable for a particular condition person or place. Effectiveness and appropriateness are terms in health care that are well suited to each other. Together they are the predominant study types utilized in research and the application of evidence in the social sciences such as psychology and nursing<sup>[1]</sup>.

A study that looks at effectiveness focuses on the evidence of effect. That would involve showing and describing how the intervention works or does not work. An effectiveness study would also show how effective the intervention is in preventing, reducing, destroying the intended target of the intervention<sup>[3]</sup>. Effectiveness studies also have to look at the benefits and harms of the intervention in its application which is often presented as a secondary finding.

Appropriateness on the other hand examines how the effect fits with the experience of the subject or looking at the intervention from perspective of the recipient<sup>[9]</sup>. Appropriateness in the area of dementia is based on several assumptions. One assumption is that the subjects are able to relate or give insight into their perspective on their experiences<sup>[10]</sup>. Through the process of undertaking this study it was difficult to determine from whose perspective appropriateness

was measured by. The perspective of the person with dementia exhibiting the behaviour would have a different view on what appropriate management is compared to a person providing care.

In this systematic review the evidence of both effectiveness and appropriateness of interventions to manage BPSD are crucial in the informing of best practice in the determining what care should be provided in the context of residential care.

#### **1.4 Research into effectiveness and appropriateness**

In the Joanna Briggs Institutes library of systematic reviews there were 91 reviews on effectiveness in health care and five on appropriateness in a total of 205 reviews indexed<sup>[11]</sup>. The Cochrane collaboration has 7819 systematic reviews or protocols registered of these 2772 look at effectiveness and 35 look at appropriateness<sup>[12]</sup>. On searching generally in title and abstracts in PubMed there were 36903 clinical trials or randomized control trials published in the last five years based on the determining of effectiveness whereas the clinical trials or randomized control trials looking at appropriateness was 723.

The search that was conducted to determine the parameters of the search for this systematic review found that a lot of the studies that are published which look at the management of BPSD are presented as text and opinion or expert opinion pieces and not necessarily primary studies. These papers contribute to the body of knowledge around the management of BPSD but did not meet the inclusion criteria to be utilized in this review.

#### **1.5 Effectiveness and appropriateness in residential aged care**

Appropriateness is the question often asked by social researchers and the chief concern of nurses, social workers and psychologists<sup>[3]</sup>. The nature of appropriateness enquiry is about the quality and nature of the experience of the subjects. It is determining not only if a treatment or an action is effective in the management of a patient but also if that action is suited to the context that the treatment is applied. This could easily be seen as effectiveness but the effectiveness studies generally report if an action is effective often irrespective of what the outcome is for the patient. Or the outcome for the patient is described as a secondary finding to the overall result of the effectiveness of the action.

Residential aged care is a controlled environment where care is provided in a long term capacity. The people who are in residential care are generally over the age of 80 years or suffer from serious illnesses or conditions which leave them permanently debilitated<sup>[13]</sup>. These illnesses can be physical or psychological or both. The social construct of the residential aged care facility is unlike other health care settings, it needs to cater for all aspects of the care for the people who reside in care<sup>[14]</sup>.

Studies that are carried out in residential aged care focus on a range of aspects of managing residents. The focus of the systematic review that forms the basis for this thesis is the behavioural and psychological symptoms of dementia.

## **1.6 Challenges in undertaking a comprehensive systematic review**

A comprehensive review is defined as a systematic review which utilizes two or more methodologies of research. The challenge in undertaking a comprehensive systematic review is in defining the parameters of the review so to include several forms of evidence. This review considered both qualitative and quantitative evidence. This was decided because on the initial search of the literature the focus of the research work was in the areas of randomized control trials, cohort studies and case control studies.

There was a difficulty in identifying qualitative papers as there were a lot of papers claiming to use qualitative methodologies but these papers failed to clearly identify the basis of the methodology<sup>[15]</sup>. There is a growing trend in social research to conduct generic qualitative research<sup>[15]</sup>. This generic research clouds the identification of the basis that the research is conducted and confounds the results.

At the outset of the review it was considered that the combination of the two styles of evidence would be difficult. The method for both qualitative and quantitative research involve the rigour of developing a protocol and testing a hypothesis<sup>[15]</sup>. The results of these studies are an experiential discussion with a declamatory statement for qualitative research and a measure of effect for the quantitative methods<sup>[2]</sup>. In research both forms of research the constant is that



questions need answers and these answers be them descriptive or numerical can be compared an contrasted providing the question is asked in the same way with the same cohort in the same context. Therefore thematically there is a direct basis for comparison. There also was the opportunity to see outcomes for the people on which the interventions are trialled.

# Chapter 2                      Background

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## 2.1     Introduction to the behavioural and psychological symptoms of dementia

This chapter intends to introduce and provide a background into what is dementia. It also gives a picture of what the impact of dementia has on the community. This chapter also will look at what BPSD is and how significant BPSD is in the running of a residential care facility and how BPSD is managed in the residential care setting.

## 2.2     Dementia

The word dementia is taken from Latin originally meaning "madness", or broken down *de-*"without" *ment*, the root of *mens*" minds"<sup>[16]</sup>. Dementia is a degenerative illness that is most prevalent in old age but can also present as early onset dementia in middle age. Dementia is an umbrella term that is used to describe multiple pathologies which effect cognition. Alzheimer's dementia is the most common form of dementia which was first described in 1906 and is thought to be primarily characterised by amyloid plaques forming in the brain<sup>[19]</sup>. There is currently no effective treatment or cure for dementia.

The incidence of diagnosed dementia is rising throughout the developed world where, on average, currently 7.5% of people over 65 years<sup>[17]</sup> have dementia. In 2009, estimates of the number of Australians with dementia were reported to be 245,000 (over 1.0% of the population). By 2050, the total number is expected to exceed 1,130,000 - in excess of a fourfold increase since 2009<sup>[18]</sup>. In 2005, there were nearly 52,000 Australians newly diagnosed with dementia <sup>[19]</sup>. By 2050, there is projected to be over 385,000 new cases every year, more than the total number of people with dementia in Australia in 2009<sup>[20]</sup>.

On the tenth of August 2012 dementia was made the ninth national health priority in Australia. The Australian Federal Minister for Ageing, Mark Butler, explained that dementia is predicted to be the leading cause of disability in Australia in less than 4 years<sup>[21]</sup>. Mr Butler stated that, "This (dementia) presents major challenges for health and aged care services." Mr Butler also said that spending on dementia beyond 2060 is set to outstrip that of any other health condition<sup>[21]</sup>.

## **2.3 Behavioural and psychological symptoms of dementia**

The BPSD [18] is the umbrella term that embraces a heterogeneous group of non-cognitive symptoms and behaviours that occur in people with dementia[22]. These behaviours can manifest as observable symptoms such as aggression (hitting, kicking, and biting) screaming, restlessness, agitation, wandering, culturally-inappropriate behaviour, sexual dis-inhibition, hoarding, cursing and shadowing[23].

## **2.4 Behavioural and psychological symptoms of dementia in residential care**

The people who suffer from dementia often go on to live in residential care, an environment where people of different backgrounds are placed together, often with cultural and religious differences, as well as with different physical and cognitive abilities. In this unfamiliar group environment a variety of behaviours manifest and often require management[24]. The management of behaviours in RACFs is a significant part of the work that is done to create a pleasant living environment for the people who reside there[25]. In Australia, in 2009 52.6% of people who were residing in a RACF had a diagnosis of dementia and were suffering from some level of BPSD[18].

## **2.5 Management of Behavioural and psychological symptoms of dementia in residential care**

The impact of people who suffer from BPSD and live in residential care is a significant factor in the safe management of a residential aged care facility. The effective management of BPSD is important in the provision of safe care to the person who exhibit behaviours, and the people who live and work with them [14]. As well as providing safe care, appropriate care is also required.

Care plans and management strategies are put in place for people who reside in residential aged care facilities[14]. These care plans govern how the care that is needed for the resident is delivered by the people who work in that facility[20]. Care plans are individualized and cover every aspect of care that is

required by the resident. The care plan which is devised is based on the assessed needs of each resident<sup>[20, 26]</sup>. The care plan and the assessment also take into consideration the environment that the care is being delivered in and the resources that are available to the staff providing care<sup>[14]</sup>. These care plans are designed to direct care and ensure that the care that is provided is constant and the needs of the residents are being met. Management strategies for BPSD are incorporated into this care planning process and the outcomes of the delivery of these interventions are regularly reviewed. A management strategy is defined as an action which is put in place to deliberately have an effect. An effective management strategy is an action which, when consistently applied has the desired effect on the resident<sup>[20]</sup>.

The use of available resources and the context in which the care is delivered is vital to the appropriate management of BPSD. Using the example of a resident with the BPSD trait of wandering who resides in a secure facility it would be appropriate and reasonable to allow the resident to wander safely throughout the facility<sup>[27]</sup>. If this resident was then taken to a different facility where there was not the availability of a secure area this would not be an appropriate intervention to manage this BPSD trait. In a different environment other interventions and other resultant behaviour would be seen. This would change the management strategies used to manage these behaviours<sup>[26]</sup>. Also the skills and the access that the staff has to expert assistance in the management of behaviours is also a factor in the type of strategy that is employed <sup>[28]</sup>. Based on these variables, the appropriateness of the intervention is dependent on where the intervention is delivered and the resources available to manage the intervention.

## 3.1 The systematic review protocol

The following chapter is a reproduction of the approved and published protocol for the systematic review on which this thesis is based. It is written in the format required by the Joanna Briggs Institute and consists of standard sections and includes some material from previous chapters (Chapter 1 and 2) as background to this review.

## 3.2 Background

### BPSD in residential care

Dementia is a degenerative illness that is most prevalent in old age. The phenomenon of interest for this review is not the illness of dementia itself and the process of dementing but how dementia-related behaviours are managed in residential care. The impact of people who live in residential care and who exhibit BPSD is a significant factor weighing on the management of a facility and the provision of safe care to the person who has the behaviours, and the people who live and work with them<sup>[14]</sup>. The other factor to note is the negative impact that unmanaged related behaviours by people with dementia has on the care staff who look after these people<sup>[29]</sup>.

The incidence of diagnosed dementia is rising throughout the developed world where, on average, currently 7.5% of people over 65 years<sup>[17]</sup> have dementia. In 2009, estimates of the number of Australians with dementia were reported to be 245,000 (over 1.0% of the population). By 2050, the total number is expected to exceed 1,130,000 - in excess of a fourfold increase since 2009<sup>[18]</sup>. In 2005, there were nearly 52,000 Australians newly diagnosed with dementia<sup>[19]</sup>. By 2050, there is projected to be over 385,000 new cases every year, more than the total number of people with dementia in Australia in 2009<sup>[20]</sup>. The people who suffer from dementia often go on to live in residential care, an environment where people of different backgrounds are placed together, often with cultural and religious differences, as well as with different physical and cognitive abilities. In this unfamiliar group environment a variety of behaviours manifest and often require management<sup>[24]</sup>. The management of behaviours in RACFs is a significant part of the work that is done to create a pleasant living environment for the people who reside

there<sup>[25]</sup>. In Australia, in 2009 52.6% of people who were residing in a RACF had a diagnosis of dementia and were suffering from some level of BPSD<sup>[18]</sup>. BPSD is the umbrella term that embraces a heterogeneous group of non-cognitive symptoms and behaviours that occur in people with dementia<sup>[22]</sup>. These behaviours can manifest as observable symptoms such as aggression (hitting, kicking, and biting) screaming, restlessness, agitation, wandering, culturally-inappropriate behavior, sexual disinhibition, hoarding, cursing and shadowing<sup>[23]</sup>.

## **Management strategies**

Care plans and management strategies are developed by care staff and implemented for people who reside in residential aged care facilities<sup>[14]</sup>. These care plans govern how the care that is need for the resident is delivered by the people who work in that facility<sup>[20]</sup>. Care plans are individualized and cover every aspect of care that is required by the resident. The care plan which is devised and based on the assessed needs of each resident<sup>[20, 26]</sup>. The care plan and the assessment also take into consideration the environment that the care is being delivered in and the resources that are available to the staff providing care<sup>[14]</sup>. These care plans are designed so to direct care and ensure that the care that is provided is constant and the needs of the residents are being met. Management strategies for BPSD are incorporated into this care planning process and the outcomes of the delivery of these interventions are reviewed. A management strategy is defined as an action which is put in place to deliberately have an effect. An effective management strategy is an action which, when consistently applied has the desired effect on the resident<sup>[20]</sup>.

## **Context of care**

The use of available resources and the context in which the care is delivered is vital to the appropriate management of BPSD. Using the example of a resident with the BPSD trait of wandering who resides in a secure facility it would be appropriate and reasonable to allow the resident to wander safely throughout the facility<sup>[27]</sup>. If this resident was then taken to a different facility where there was not the availability of a secure area this would not be an appropriate intervention to manage this BPSD trait. Other interventions and other resultant behavior would be seen and the management strategies would have to cover all of these would be very different<sup>[26]</sup>. Also the skills of and the access that the facility

staff has expert assistance in the management of behaviours is also a factor in the type of strategy that is employed [28]. Based on these variables, the appropriateness of the intervention is dependent on where the intervention is delivered and the resources available to manage the intervention.

This review has been undertaken as a comprehensive review. The decision was informed by the initial literature searches showed that studies with appropriate interventions which focused on the management of behaviours were both conducted as qualitative and quantitative research. The mixed methods style of review was also considered in the perpetration of this work. It was also decided that this review would not focus on one sort of behavior such as calling out or wandering. This was decided because there were previous reviews that focused on a single type of behavior.

A search of the Joanna Briggs Library of systematic Reviews, Cochrane Library, PubMed and CINAHL, showed there were no other other systematic review was published or being undertaken when this review commenced.

### **3.3 Objective**

The aim of this review is to identify and synthesize the best available evidence of the effectiveness and appropriateness of strategies used to manage Behavioral and Psychological Symptoms of Dementia (BPSD) in the residential care setting.

### **3.4 Review question**

What is the effectiveness of currently available strategies used to manage Behavioral and Psychological Symptoms of Dementia (BPSD) in the residential care setting?

How appropriate are currently available strategies used to manage Behavioral and Psychological Symptoms of Dementia (BPSD) in the residential care setting?

### 3.5 Criteria for considering studies for this review - Inclusion criteria

#### Types of participants

The participants of interest for this review are people aged 65 years and older, regardless of gender, ethnicity, co-morbidities who are RACF or equivalent. Studies that focused on acute psycho-geriatric inpatients were not considered for inclusion as the type of care given to these patients is not consistent with the residential aged care model and is more akin to acute psychiatric care.

The participants included in this review must have a diagnosis of dementia and exhibit behaviours which require a degree of modification or management so that they can be safely managed in a residential care facility.

#### Definitions

For this systematic review, the following definitions were used:

Appropriateness is the extent to which an intervention or activity fits with or is apt in a situation. Clinical appropriateness is about how an activity or intervention relates to the context in which the care is given<sup>[2]</sup>.

Behavioral and Psychological Symptoms of Dementia (BPSD) is an umbrella term that embraces a heterogeneous group of non-cognitive symptoms and behaviours that occur in people with dementia <sup>[22]</sup>. Behaviours may include: hitting, kicking, biting, screaming, restlessness, agitation, wandering, culturally-inappropriate behavior, sexual dis-inhibition, hoarding, cursing and shadowing.

Effective management strategies can be defined as interventions that reduce the manifestation of described symptoms through the explicit use of a single intervention or combination of interventions <sup>[30]</sup>.

Management strategies' will be used to refer to specific interventions designed to limit the impact of an action on the person or on the people whom the person interacts with <sup>[31]</sup>.

RACFs are defined as a facility which has been subsidized and sanctioned to provide care to older people (over 65 years commonly) who can no longer live independently<sup>[14]</sup>.



## **Types of interventions**

The review focused on interventions designed to make the management of people exhibiting the BPSD in residential care easier for the staff and the person suffering with the behaviours. It was anticipated that these interventions would fall into six categories and this was confirmed by what was found in the studies.

- 1) Standard behavioral therapies, (e.g., reality orientation, validation therapy, reminiscence therapy).
- 2) Alternative therapies, (e.g., art therapy and music therapy).
- 3) Complementary therapies, (e.g., aromatherapy, bright-light therapy and multi-sensory approaches).
- 4) Psychotherapies, (e.g., cognitive-behavioral therapy and interpersonal therapy).
- 5) Environmental factors of facility, (e.g., design, decoration and lighting).
- 6) Pharmacological interventions, (e.g. antipsychotic medication).

## **Types of comparators**

There are many different comparators used in the monitoring of behaviours in residential care. The basic comparator of the presence or absence of incidents is the simplest and most obvious comparator between groups of residents after the application of an intervention. These observational measures are the most frequently reported comparator for interventions. The use of psychomotor tools as baseline measures such as the mini mental state exam (MMSE)<sup>[32]</sup>, the Cohen Mansfield Agitation Inventory (CMAI)<sup>[33]</sup> and the Neuro-Psychiatric Inventory (NPI)<sup>[34]</sup> ensures that the groups are comparable at entry to the study and show the level of cognitive functioning at the end point of a study.

## **Types of outcomes**

For the quantitative component of the review, the effective management of behaviours was evidenced through a change in the frequency or severity of the BPSD. The most common and most reliable indicators of effectiveness of outcomes were incident rates of behaviours manifesting. The included studies examined a range of interventions to monitor the effectiveness of an intervention. The qualitative component of the review considered the appropriateness of strategies used to manage BPSD. This section of the review will also examine reported incidence rates, as they relate to what is considered to be appropriate management of behaviours, based on the residents and the care givers experiences.

## **Context**

This review considered studies that focus on the residential care context or studies that could be applied to residential care. The included studies were found in many different geographical regions predominately Australia, North America, The United Kingdom, Germany and Scandinavia.

## **Types of studies**

This review looked at both quantitative and qualitative evidence in the form of primary research. The quantitative component comprised of randomized controlled trials, cohort and descriptive studies.

The qualitative component considered studies which utilized qualitative research methods, such as phenomenology, grounded theory and action research.

Non research evidence (text and opinion) was not considered for inclusion in this review as the text and opinion pieces added little to the research findings.

### 3.6 Search strategy and process

The search strategy aimed to find both published and unpublished studies from the inception of the listed databases to March 2012. A three-step search strategy was used in the search for quantitative evidence and then again in the search for qualitative evidence in this review. An initial limited search of PubMed and CINAHL was undertaken which yielded 26000 articles. This search was the first phase of the search and used to assist in the development of search terms. To correctly identify appropriate key words, terms commonly contained in the title and abstract and of the index terms used to describe the article were undertaken. From this pilot study, Medical subject headings (MeSH) terms for each of the data bases were utilized to identify potentially relevant research articles (Appendix I). The original protocol logic grid was used as a guide to determine which term covered the majority of the anticipated key words. The MeSH terms that worked well in PubMed, CINAHL, and EMBASE were

“Behavior” and “dementia” and “management” and “aged care”.

These terms were also used as a key word search in Scopus using the subject suggest term key as a guide.

The term for aged care proved to be the most challenging in establishing a consistent terminology across databases. This was where the MeSH term was essential in identifying appropriate literature. Aged care has a strong relationship with community care which provided a very different set of interventions and literature in relation to behavior management. These articles focused on caregiver burden and also looked at educating an un-trained person in interventions and management in the community not an institutional setting.

The second stage of the process was a grey literature search conducted using Google Scholar Google. This was also done using the key words dementia and behavior and aged care and separately BPSD and Behavioral and psychological symptoms of dementia. This search provided an enormous amount of material 578,000 Google in sites and 47,100 in Google Scholar.

Thirdly, the reference list of all identified reports and articles were searched for additional studies. It was decided that only studies published in English will be considered for inclusion in this review.

Alerts in each database were set up to inform the researcher of newly published relevant literature. The search also sought to include unpublished studies (such as these, dissertations and conference proceedings) where possible using MedNar and ProQuest theses and Dissertations database to eliminate publication bias.

It was observed that there are a lot of text and opinion papers written on this subject and this seems to be the most prevalent form of publication on dementia. But as text and opinion articles were not the focus of this review, it was decided not to retrieve these citations. But this as a separate review would create an interesting follow up or companion review. Appendix II details an example search strategy used for the Pub Med database. Studies not selected for retrieval are presented in Appendix III.

### **3.7 Method of the review**

#### **Critical Appraisal**

Quantitative papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (Appendix IV).

Qualitative papers selected for retrieval were assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Qualitative Assessment and Review Instrument (Appendix IV).

Had any disagreements arisen between the reviewers, it was planned they would be resolved through discussion, or with a third reviewer. This was not necessary and no studies were excluded following critical appraisal.

#### **Data extraction**

Quantitative data was extracted from papers and placed in the Joanna Briggs Institute data extraction instrument Meta-Analysis of Statistics Assessment and Review Instrument (MASTARI). This data is double entered and for the purpose of this review it will only be done by the primary reviewer.

Qualitative data is extracted using the Qualitative Appraisal and Review Instrument (QARI). This data is as direct quotes to reflect the voices of the participants of the studies.

## **Data analysis and synthesis**

Quantitative data is reviewed for heterogeneity of studies. This involves ensuring that the outcome measures are similar and there is an ability to compare scientific methods. When this is comparable the data can be used for meta-analysis which involves determining effect sizes and combining results to give an overall evidence of effect for the phenomena. This can be achieved with two or more similar studies.

Qualitative data is grouped into themes and from here similarities are looked for with the aim of making a declaratory statement which summarizes the sentiment of the voices reflected in the studies.

## **Conflicts of interest**

None to declare

## **Acknowledgments**

As this systematic review is part of a Masters of Clinical Sciences thesis, a secondary reviewer Melissa Saliba was used for critical appraisal only.

# Chapter 4      Results

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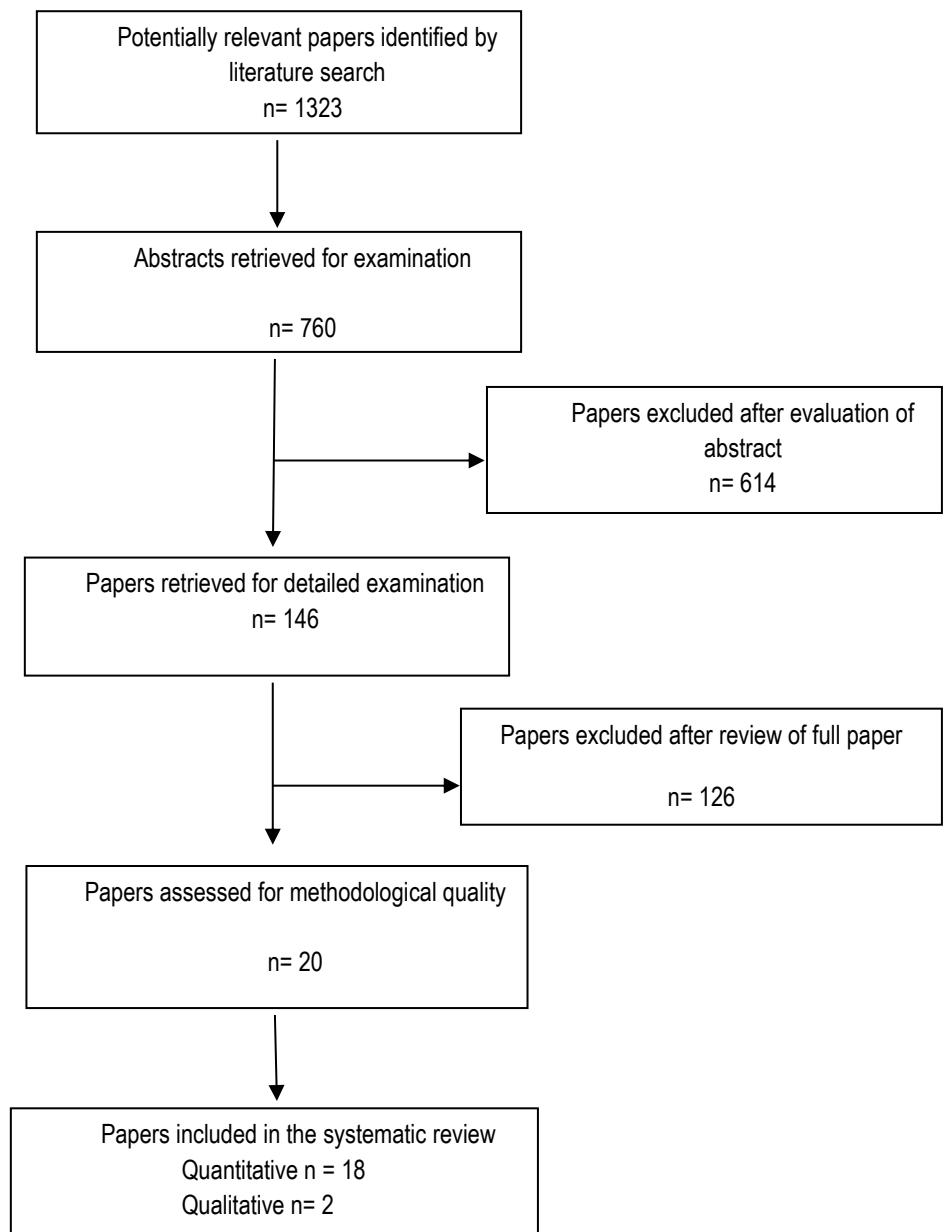
## **Results**

This chapter aims to simply present and display the results of the systematic review search. This aims to bring context to the amount of information searched and the process of sorting this information.

### **4.1 Results of search**

The electronic database searching yielded 1323 articles after the removal of 224 duplicate articles. Of these, 760 abstracts were examined and from there 614 papers were excluded following examination of the title and abstract. 146 papers were retrieved for full text examination, of these papers, 126 were excluded and reasons for exclusion are listed in Appendix III. The remaining 20 papers were assessed for methodological quality by the primary and secondary reviewers. Of these papers, 18 were quantitative studies and were assessed using the Joanna Briggs Institute MASTARI program and tool<sup>[2]</sup> Appendix IV. The remaining two papers utilized qualitative methodologies and were assessed using the Joanna Briggs Institute QARI program <sup>[2]</sup> and tool (Appendix IV). No studies were excluded based on methodological quality. Characteristics of included studies can be found in Appendix VII.

Figure 1 Flowchart detailing study identification and selection



## 4.2 Methodological assessment of studies

This chapter will look at the methodological qualities of both the qualitative and quantitative studies. This chapter will clearly outline how the studies scored on the Joanna Briggs Institutes critical appraisal tools.

### 4.2.1 Methodological quality of Qualitative studies

There were two qualitative studies assessed for methodological quality and consensus was reached on all papers by the primary and secondary reviewer. The results of methodological assessment is shown in Table 1 and the corresponding questions (Q1-Q10) can be found in the QARI checklist in Appendix IV and how the studies compared to the checklist is discussed in detail below.

Table 1 Critical appraisal of Qualitative Studies

| Citation                               | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 |
|--|----|----|----|----|----|----|----|----|----|-----|
| Gerdner, L. A., 2005                   | N  | N  | N  | N  | N  | Y  | Y  | Y  | Y  | Y   |
| Götell, E., Brown, S., Ekman, S., 2009 | N  | N  | N  | N  | N  | Y  | Y  | Y  | Y  | Y   |

### **Research methodology**

Gotell et al. 2007<sup>[35]</sup> and Gerdner 2005 <sup>[36]</sup> identified their studies as being qualitative and conducted qualitative content analysis. Neither Gotell et al. 2007 nor Gerdner 2005 <sup>[36]</sup> stated what philosophical perspective their research was conducted in, without knowing this it was impossible to determine congruity between the question and objectives, methodology and method used to collect data and methodology and data representation.



### **Researchers Influence**

Gotell et al. 2007 <sup>[35]</sup> stated that the research took place in Sweden and explicitly located the cultural and theoretical basis that the research came from. Gotell et al. 2007 also acknowledged the previous work that they conducted in this area and how this impacted on this study. Gerdner 2005 <sup>[36]</sup> clearly stated that the study was carried out in North America in a publicly funded facility. The influence of Gerdner's 2005 <sup>[36]</sup> previous studies conducted in this area was quite evident and heavily influence this study.

### **Outcomes Ethical approval and conclusions**

Gotell et al. 2007 <sup>[35]</sup> and Gerdner 2005 <sup>[36]</sup> identified all participants, residents, care workers and family members and all of their voices were adequately heard in these studies. Both studies had approval of their local ethics committees the Blekinge Institute for Gotell et al. 2007<sup>[35]</sup> and the University of Minnesota for Gerdner et al. 2005<sup>[36]</sup>.

Both Gotell et al. 2007 <sup>[35]</sup> and Gerdner 2005 <sup>[36]</sup> drew conclusions in the research which flowed from the analysis, or interpretation, of the data that was obtained. There are no conclusions that were made that could not be directly related back to the results and traced through the discussion of the results.

#### 4.2.2 Methodological quality of Quantitative studies

The 18 quantitative studies were assessed for methodological quality and consensus was reached on all papers by the primary and secondary reviewer. Nine of these studies were randomized control trials or pseudo randomized control trials, one was a case control study and five were descriptive case series studies. The details and methodological assessment of the included quantitative studies are below.

##### 4.2.2.1 Randomized control trials and Pseudo-randomized trials

The nine randomized control trials or pseudo randomized control trials were assessed against the criteria for randomized control trials and pseudo randomized control trials (Appendix IV) The results of methodological assessment is shown in Table 2. The corresponding questions (Q1-Q10) can be found in the MASTARI checklist in Appendix IV and how the studies compared to the checklist is discussed in detail below. Questions one to five relate to the process of randomization and allocation of participants and treatments. Question six to ten relate to the treatment groups, the intervention and the outcome measures and statistical analysis of the intervention.

Table 2 Critical appraisal of Randomized Control Trial / Pseudo-randomized Trial

**Randomized Control Trial / Pseudo-randomized Trial**

| Citation  | Q1 | Q2  | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 |
|---|----|-----|----|----|----|----|----|----|----|-----|
| Crotty, M., Halbert, J., Rowett, D., Giles, L., Birks, R., Williams, H., Whitehead, C., 2004                                | Y  | N/A | Y  | Y  | U  | Y  | Y  | Y  | Y  | Y   |
| Ballard, C. G., O'Brien, J. T., Reichelt, K., Perry, E. K., 2002  | Y  | Y   | U  | Y  | Y  | Y  | Y  | Y  | Y  | Y   |
| Brodaty, H., Ames, D., Snowdon, J., Woodward, M., Kirwan, J., Clarnette, R., Lee, E., Greenspan, A., 2005                   | Y  | Y   | U  | Y  | U  | Y  | Y  | Y  | Y  | Y   |
| Pollock, B. G., Mulsant, B. H., Rosen, J., Mazumdar, S., Blakesley, R. E., Houck, P. R., Huber, K. A., 2007                 | Y  | Y   | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y   |
| Luttenberger, Katharina, Donath, Carolin, Uter, Wolfgang, Graessel, Elmar, 2012   | Y  | U   | U  | Y  | Y  | Y  | Y  | Y  | Y  | Y   |
| Ruths, S., Straand, J., Nygaard, H. A., Bjorvatn, B., Pallesen, S., 2004  | Y  | Y   | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y   |
| Frank, L., Kleinman, L., Ciesla, G., Rupnow, M. F. T., Brodaty, H., 2004  | Y  | Y   | U  | N  | Y  | Y  | Y  | Y  | Y  | Y   |
| Peskind, E. R., Tsuang, D. W., Bonner, L. T., Pascualy, M., Riekse, R. G., Snowden, M. B., Thomas, R., Raskind, M. A., 2005 | Y  | Y   | Y  | Y  | Y  | Y  | Y  | Y  | Y  | Y   |
| Cohen-Mansfield, J. & Werner, P., 1998  | Y  | N   | N  | Y  | N  | Y  | Y  | U  | Y  | Y   |

## Randomization and allocation methods

All of the studies selected described a process consistent with randomization of participants. Most commonly this was described as a double blind placebo controlled trial<sup>[37] [38, 39] [40, 41] [42]</sup>. The remaining two studies described the randomization of participants in a single blind trial <sup>[43]</sup> or a trial which randomizes the facilities in which a single blind process was used<sup>[28]</sup>. There was one pseudo randomized control trial which randomized both participants and interventions but then subjected all the participant to each intervention<sup>[44]</sup>.

The process of blinding was clearly discussed in the majority of the studies <sup>[37] [38, 39] [40, 41] [42]</sup>. This blinding was done either through the use of computer number generation or external participants selecting the participants. Blinding the participants was not applicable for Crotty et al. 2004 <sup>[28]</sup> as this study relied on education of participating groups and direct intervention from the expert management team at the treatment site. The blinding was unclear in the study by Luttenberger et al. 2012 <sup>[43]</sup> which stated that the process was computerized and gave no details to the exact process and who was involved. Cohen Mansfield et al. 1998<sup>[44]</sup> does not describe a process of blinding to the allocation of treatment groups.

The concealing of the treatment groups was not addressed in the papers presented by Brodaty et al. 2005<sup>[38]</sup>, Luttenberger et al. 2012<sup>[43]</sup> and Frank et al. 2004<sup>[39]</sup> this was considered a potentially confounding factor for all of these papers. The paper by Ballard et al. 2002<sup>[2]</sup> described the process of blinding but the allocator was not explicitly mentioned and the process described talks of blinding the facilities to the comparison of the control to the active treatment to avoid bias. Luttenberger et al. 2012<sup>[5]</sup> describe a process where a computer program allocated the participants but does not mention an allocator as part of the blinding process. Frank et al. 2004<sup>[39]</sup> discusses double blinding but does not describe the process or who conducted the final allocation after the extensive screening process was conducted. Cohen-Mansfield et al. 1998<sup>[44]</sup> does not address the concealing of treatment groups in this study. The studies by Crotty et al. 2004<sup>[28]</sup>, Pollock et al. 2007<sup>[37]</sup>, Ruths et al. 2004<sup>[40]</sup> and Peskin et al. 2005<sup>[42]</sup> clearly state who the allocator was and the efforts that were taken to conceal the groups. Cohen Mansfield et al. 1998<sup>[44]</sup> Frank et al. 2004<sup>[39]</sup> did not seemingly have any subjects which withdrew from their study based on the numbers in the statistical analysis, however this outcome was not explicitly stated in this paper. The other papers reported what happened to the subjects that withdrew. Peskind et al. 2005<sup>[42]</sup> reported subjects withdrew because of drug reactions or the need for a different medication or staff were unable to tolerate the disruptive behavior any longer and it was determined that

to manage the residents BPSD additional medication was required. Pollock et al. 2007<sup>[37]</sup> reported similar dropout reasons and interpreted those reasons for their drug related trial. Ruths et al. 2008<sup>[40]</sup> trial detailed subjects that withdrew with the main reason being significant changes in behavioral symptoms and in one case death attributed to other co-morbidities. Ballard et al. 2002<sup>[41]</sup> reported one withdrawal due to death related to co-morbidities. Luttenberger et al. 2012<sup>[43]</sup> reported all subjects that could not complete the study and reported intention to treat statistics in its analysis. Crotty et al. 2004<sup>[28]</sup> reported death as the main reason that subjects did not complete this study, this study had the largest dropout rate as it had the population which was the most moribund. Brodaty et al. 2005<sup>[38]</sup> used the evidence of how many people withdrew from the study to illustrate the levels of negative effects of the medications that were being examined for effectiveness.

Crotty et al. 2004<sup>[28]</sup> discusses the process of developing a control group and the uses of individual aged care facilities as the way to separate the different interventions for staff and patients. It also describes a staff contact person at each site who is responsible for assessing the intervention though it is unclear if these people are blind to allocation but it could be assumed through the efforts to separate interventions into different facilities. Brodaty et al. 2005<sup>[38]</sup> discusses the role of the investigator and states that the processes are double blind but does not explain how this process was conducted, making this unclear. Blinding was not a concern with the Cohen Mansfield et al. 1998<sup>[44]</sup> study and considered not applicable in assessment of methodology. The remaining studies<sup>[41] [37] [39, 42, 43, 45]</sup> described who and how those who were assessing outcomes were blinded to the treatment allocation.

### **Treatment groups, outcome measures and statistical analysis**

All of the papers for this review had control and treatment groups that were comparable at entry in terms of demographics, gender split, and the level of BPSD symptoms exhibited or the type of BPSD symptoms exhibited. Each of the studies reported an extensive level of assessment of each subject group prior to randomization. The main way that this was assessed was through psychometric testing such as the Cohen Mansfield Agitations Inventory (CMAI) which looks at the subject's level of agitation. These baseline assessments were also used as outcome measures in several of the studies. All described how groups were treated identically other than for the named interventions. All of the studies had numerous outcome measures and they were conducted the same way for treatment and control groups. Validated tools were used to measure outcomes and these are illustrated in table 2. The papers discussed the use of the validated tools and the training or educational levels that were involved in the

use of these tools. An appropriate statistical analysis was used in all papers, most commonly statistical software. Pollock et al. 2007<sup>[37]</sup> and Frank et al. 2004 used SAS statistical software version 8, SPSS software version 11 was used by Ruths et al. 2008<sup>[40]</sup> Ballard et al. 2002<sup>[41]</sup>. Crotty et al. 2004<sup>[28]</sup> used Stata version 7 for statistical analysis. Luttenburger et al. 2012<sup>[43]</sup> used PASW 18.0 for statistical analysis. Brodaty et al. 2005<sup>[38]</sup>, Peskind et al. 2005<sup>[42]</sup> and Cohen Mansfield et al. 1998<sup>[44]</sup> have all employed statistical tests but did not disclose the process that they used to apply those tests. The Statistical tests employed in all the studies were based on the comparison of like populations. These tests t test single and multi-variant and the chi squared test were used by Cohen Mansfield et al. 1998<sup>[44]</sup>, Pollock et al. 2007<sup>[37]</sup> and Luttenburger et al. 2012<sup>[43]</sup>. Luttenburger<sup>[43]</sup> also focused on intention to treat as a way of illustrating total effect of the intervention. Analysis of covariance was employed by Brodaty et al. 2005<sup>[38]</sup>, Frank et al. 2004<sup>[39]</sup> and Ruths et al. 2008<sup>[40]</sup> which is appropriate as they look at the relationship between two variables. Ballard et al. 2002<sup>[41]</sup> used the Mann-Whitney test as the data was nonparametric. Crotty et al. 2005<sup>[28]</sup> reported a confidence interval as this study looked at the frequency of occurrences this was appropriate.

#### 4.2.3 Case Control Studies

The single case control study methodological quality was assessed against the criteria for comparable cohort/ case control studies, the checklist question Q1-Q9 can be found in Appendix IV. The results of the methodological assessment is shown in Table 3 and discussed in further detail below. This overall quality will be explored at the end of the methodology section.

Table 3 Critical appraisal of Comparable Cohort / Case Control Studies

#### Comparable Cohort / Case Control Studies

| Citation   | Q1 | Q2 | Q3  | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 |
|--|----|----|-----|----|----|----|----|----|----|
| Cohen-Mansfield, J.<br>Marx, M. S, Dakheel-<br>Ali, M., Regier, B.<br>Thein, K. &<br>Freedman, L, 2010 | Y  | Y  | N/A | N  | Y  | Y  | Y  | Y  | Y  |

#### 4.2.3.1 Allocation methods

The study by Cohen- Mansfield et al. 2010 <sup>[46]</sup> had a population which was selected based on the observable symptoms of a group of residents living in seven different nursing homes. This was determined using validated agitation monitoring tool CMAI. For this study, both cases and of controls were derived from a single representative cohort.

#### 4.2.3.2 Confounding factors, outcome measures and statistical analysis

Confounding factors were not adequately addressed in the study by Cohen- Mansfield et al. 2010 <sup>[46]</sup>. Potential confounding factors with this study are related to the assessment of engagement, observation and the development of the self-identity stimuli. The observer and the assessor of the intervention had no inter-rater reliability assessed and there was no mention if these were the only research assistants applying and observing the stimuli. The development of the self-identity stimuli was not explained and nor was the process of the research assistant developing this stimuli for the residents. The interventions were administered in a timely and considered manner.

There were no subjects who withdrew after inclusion in the Cohen-Mansfield et al. 2010 <sup>[46]</sup> trial. The outcomes were observation of agitation and agitated behaviours which are a reasonable and reliable method for assessing this intervention. Statistical analysis was conducted with the aim of showing differences using chi-square.

#### 4.2.4 Descriptive Studies / Case Series

The eight descriptive studies/case series studies were assessed for methodological quality against the criteria for descriptive/case series studies (Appendix IV) The results of the methodological assessment is shown in Table 4 and discussed in further detail below.

Table 4 Critical appraisal of Descriptive Studies / Case Series

**Descriptive / Case Series Studies**

| Citation   | Q1 | Q2 | Q3 | Q4 | Q5  | Q6  | Q7  | Q8 | Q9 |
|--|----|----|----|----|-----|-----|-----|----|----|
| Cohen-Mansfield, J.,<br>Dakheel-Ali, M.,<br>Thein, K., Marx, M.<br>S., 2009                    | N  | Y  | Y  | Y  | Y   | Y   | Y   | Y  | Y  |
| Cohen-Mansfield, J.,<br>Thein, K., Marx, M.<br>S., Dakheel-Ali, M.,<br>2011                    | N  | Y  | Y  | Y  | N/A | Y   | N/A | Y  | Y  |
| Ramadan, F. H.,<br>Naughton, B. J.,<br>Prior, R., 2003   | Y  | Y  | Y  | Y  | Y   | Y   | N/A | Y  | Y  |
| Pitkala, K. H., Laurila,<br>J. V., Strandberg, T.<br>E., Tilvis, R. S., 2004                   | N  | Y  | Y  | Y  | Y   | Y   | N   | Y  | Y  |
| Zuidema, S. U., De<br>Jonghe, J. F. M.,<br>Verhey, F. R. J.,<br>Koopmans, R. T. C.<br>M., 2011 | N  | Y  | Y  | Y  | Y   | N   | Y   | Y  | Y  |
| Cornegé-Blokland,<br>Esther, Kleijer, Bart<br>C., Hertogh, Cees M.<br>P. M., J., 2012          | N  | Y  | Y  | Y  | N/A | N   | N/A | Y  | Y  |
| Ervin, Kaye,<br>Finlayson, Sarah,<br>Cross, Maddalena,<br>2012                                 | N  | Y  | N  | Y  | N/A | N/A | N/A | Y  | Y  |
| Khan, F. & Curtice,<br>M., 2011  | N  | Y  | N  | Y  | N/A | Y   | Y   | Y  | Y  |



#### 4.2.4.1 Randomization and allocation methods

Ramadon et al. 2003<sup>[47]</sup> used a pseudo-randomization process to divide participants into three treatment groups. The study by Cohen-Mansfield 2009<sup>[48]</sup> claimed to use a process of randomization which was not evident in the study or described. Zuidema et al. 2011<sup>[49]</sup>, Pitkala et al. 2004<sup>[50]</sup>, Khan et al. 2011<sup>[51]</sup>, Cornege-Blokland et al. 2012<sup>[52]</sup> are case series or convenience samples of residents or the staff who work with them. Each study described inclusion criteria for their studies. Ervin et al. 2012<sup>[26]</sup>, Kahn et al. 2011<sup>[51]</sup> and Cornege-Blokland et al. 2012<sup>[52]</sup> focused on people who work in residential care and their sample criteria was based on the facility they worked in and the severity of the behaviours of the patients they were working with. Cohen Mansfield et al. 2009<sup>[48]</sup> and Cohen Mansfield et al. 2011<sup>[53]</sup> were based on the application of an action to monitor the impact of residents' BPSD on the care workers.

#### 4.2.4.2 Confounding factors, outcome measures and statistical analysis

Confounding factors were addressed in the study by Cohen-Mansfield 2009<sup>[48]</sup> which was an observational study. In this study there were three observational measures taken and these were taken by trained research assistants who were assessed for inter-rater reliability, it was acknowledged that the assessment of engagement was problematic and this led to the exclusion of several participants who had missing or aberrant data. Inter-rater reliability was assessed in the observational studies by Cohen Mansfield et al. 2011<sup>[53]</sup>, Pitkala et al. 2004<sup>[50]</sup> and Zuidema et al. 2011<sup>[49]</sup> showing good correlation. Zuidema et al. 2011<sup>[49]</sup> also acknowledges the impact of the environmental factors and the resident's comorbidities would be potentially confounding. Ramadon et al. 2003<sup>[47]</sup> and Pitkala et al. 2004<sup>[50]</sup> state that the rating scales that they used were potentially confounding they also stated the steps they took to address this. Ramadon et al. 2003<sup>[47]</sup> and Pitkala et al. 2004<sup>[50]</sup> also felt this was a limitation of their studies. Cornege-Blockland et al. 2012<sup>[52]</sup> identified that the physicians that participated in the study were those who were proactive in the field and a potential problem with selection bias. Ervin et al. 2012<sup>[26]</sup> and Khan et al. 2011<sup>[51]</sup> did not cite or identify any confounding factors.

Outcomes were assessed in measurable and reproducible ways in all the studies. The studies by Cohen Mansfield et al. 2009 and Pitkala et al. 2004<sup>[50]</sup> focused on observational outcomes of BPSD symptoms and their impact. Cohen Mansfield et al. 2011<sup>[53]</sup> looked at the observation of barriers to the implementation of non-pharmacological interventions as an outcome. Ramadon et al. 2003<sup>[47]</sup> has clusters of behaviours correlated to the use of medication and the behavior clusters as the outcome measure, this was an observational study. Cornege-Blockland et al. 2012<sup>[52]</sup>, Ervin et al. 2012<sup>[26]</sup> and

Khan et al. 2011<sup>[51]</sup> were interview and questionnaire based studies and measured the responses of staff as an outcome. Zuidema et al. 2011<sup>[49]</sup> has staff distress as an outcome which was correlated to symptoms and psychotic medication use this was complex in a large cohort.

The follow up time for Cohen Mansfield et al. 2011<sup>[53]</sup>, Cornage-Blockland et al. 2012<sup>[52]</sup> and Ervin et al. 2012<sup>[26]</sup> were not relevant to the results that they produced as the studies were based on the experiences of the people who work with residents with BPSD and their experiences cannot be contained to the single sample of residents. Cohen Mansfield et al. 2009<sup>[48]</sup> conducted this study over four days with interventions evenly spaced to prevent fatigue by the subjects. Ramadan et al. 2003<sup>[47]</sup> used a two week data set which was an appropriate length of time to give a snapshot of medication used with a large number of residents. Pitkala et al. 2004<sup>[50]</sup> had a 12 month recruiting and observation phase which yielded significant data in a large cohort. Zuidema et al. 2011<sup>[49]</sup> did not discuss the time frames that the study was conducted over.

Subjects which withdrew were addressed in the studies by Khan et al. 2011<sup>[51]</sup>, Zuidema et al. 2011<sup>[49]</sup> and Cohen-Mansfield 2009<sup>[48]</sup> addressed the subjects who withdrew from the studies or refused to participate. Pitkala et al. 2004<sup>[50]</sup> did not address subjects who withdrew and owing to the size of the study and the length of time that it was carried out over with a frail aged cohort it is surprising that this is not addressed. The studies by Cohen Mansfield et al. 2011<sup>[53]</sup>, Ramadan et al. 2003<sup>[47]</sup>, Cornage-Blockland 2012<sup>[52]</sup> and Ervin et al. 2012<sup>[26]</sup> were questionnaire and observation based studies which were a snap shot and therefore there were no withdrawals from the study.

Statistical analysis was conducted in all studies albeit only as a percentage of respondents in the studies by Cornage-Blockland et al. 2012<sup>[52]</sup>, Ervin et al. 2012<sup>[26]</sup> and Khan 2011<sup>[51]</sup>. Zuidema et al. 2011<sup>[49]</sup> used an odds ratio to correlate the use of medication to the staff distress and the presence of the symptoms. Chi squared and t tests were used in the studies by Cohen Mansfield et al. 2009<sup>[48]</sup>, Cohen Mansfield 2011<sup>[53]</sup>, Ramadan et al. 2003<sup>[47]</sup> and Pitkala et al. 2004<sup>[50]</sup> as they all collected data with variable distribution.

## 4.3 Findings from Individual Included Studies

In the section follows a textual description of the results from each included study. Data was extracted from the quantitative and qualitative studies using tools shown in Appendix V. Characteristics of the included studies are tabulated in Appendix VI.

### 4.3.1 Findings of the included qualitative studies

#### ***Gerdner, L. A. 2005<sup>[36]</sup> Use of individualized music by trained staff and family: translating research into practice***

Gerdner 2005, <sup>[36]</sup> conducted a study into the effectiveness of music to manage agitation. This study used qualitative data and quantitative data sources to compare perspectives of family and staff. The music intervention was used at a prescribed time such as during hygiene being attended and as required when the subject became agitated. The music was selected especially for each resident so that the music would have some meaning to them; this was done through interviews with the subjects and their families. The residents carers' and family members comments were recorded from both the interview and incidentally throughout the intervention. In this study there was also a component of observational measures collected. This is presented as qualitative study but had a mixed methods component. The families and staff were trained in the use of the agitation visual analogue scale (VAS) and the modified version of the Cohen Mansfield Agitation Inventory (MCMAI). This study reported an overall reduction in MCMAI scores and VAS scores with the use of music therapy. The staff and the families were also interviewed and this explored the meaningfulness of music therapy which was overwhelmingly positive for all who were involved. The study reported that subjects were freer to talk to each other and their family members and the staff. There was a common focus of attention to discuss and there were reports of residents coming together and discussing the music. There was also a secondary finding of improved staff wellbeing and satisfaction with the use of music as an intervention to manage general agitation. No other BPSD behaviours were discussed in this paper. Five findings were extracted from this paper, all of which are supported by illustrations and are presented below in Table 5.

Table 5 Findings from Gerdner et al. 2005 [36]

**Use of individualized music by trained staff and family: translating research into practice**

|              |  |
|--------------|--|
| Finding 1    | Music is a catalyst for meaningful interactions between the staff and residents  |
| Illustration | It made it easier to work with her. pg. 26   |
| Finding 2    | Music assisted in improving responsiveness   |
| Illustration | When i turn the music on, the elderly ladies come into mom's room and they set down on the bed. Mom doesn't interact a whole lot anymore. However two or three times i have walked in and there was mom's roommate and two or three others sitting on the bed and they are actually talking cause they are listening to the music. They love Frank Sinatra so I think it helps with socialization pg. 28 |
| Finding 3    | Effects of music   |
| Illustration | It has a calming effect pg. 27   |
| Finding 4    | Effects of music   |
| Illustration | She seemed to calm down when they put it on and she seemed to enjoy it. When she gets anxious she gets confused. When I turn on the music it gets rid of the anxiety and you kept listening to the music and start talking to her she would normally come back to where she knew where she was pg. 27-28   |
| Finding 5    | Effects of music   |
| Illustration | It seemed to wipe the frown off her face, it seemed to give her pleasure pg. 28  |

Gerdner 2005, [36] demonstrated both effectiveness and appropriateness of the use of music. Music as an intervention had the secondary effect of improving staff wellbeing which led to better outcomes for the residents.

***Götell et al. 2007<sup>[35]</sup> the influence of caregiver singing and background music on vocally expressed emotions and moods in dementia care: a qualitative analysis***

Götell et al. 2007<sup>[35]</sup> explored the impact of singing by caregivers on patients with dementia in Sweden. In this study the participants were videotaped. This was the interaction between the person with dementia and the care giver whilst having hygiene attended. The use of video allowed the emotions of the subject and the caregiver to be seen and the interactions recorded. The voices of the people receiving care and the person delivering care were presented equally in context in the study. The base line observations showed that the caregivers were energetic and happy which was not well received by the persons with dementia. It was seen that laughter was an expression of uncertainty and humor was not well received. With the introduction of music some of the pressure was taken off of the carers who did not feel that they had to be as much of a presence. Caregiver singing and background recorded music was applied to the same situations and the responses from people with dementias were videotaped and analyzed. The presence of music be it recorded or through caregiver singing was seen to subtly enhance a positive environment and assist in arousing positive emotions in the people with dementia. The quality of the singing was also not considered important and much as the familiarity of the tune and the spirit in which it is delivered in. Four findings were extracted from this paper, all of which are supported by illustrations and are presented below in Table six.

Table 6 Findings from Götell et al. 2007<sup>[35]</sup>

**The influence of caregiver singing and background music on vocally expressed emotions and moods in dementia care: a qualitative analysis**

|              |  |
|--------------|--|
| Finding 1    | The carers usual care the enthusiasm that is expressed by carers irritates patients  |
| Illustration | There was an overall disparity between the energy expressed by the carer and the patient, "Wash yourself a little", Carer prompts in a vigorous and friendly way. ";oy, oy, oy" the patient answers with a thin and week voice. pg 426   |
| Finding 2    | The use of background music helps the patient match the enthusiasm for the task to the carer   |
| Illustration | Caregivers and persons with dementia seemed excited when expressing mutual warmth and playfulness. Such a situation is described here when the waltz "Den gamle dsnsbanant"; (the old dance Pavilion) played in the ackground. "Patients name Carer says sounding happy and enticing. Yes Patient answers sounding dreamy and friendly." Step into the skirt here,"; Carer continues sounding positive and enticing the patient laughs with delight. Pg. 427 |
| Finding 3    | Singing creates an overwhelmingly positive emotion and mood  |
| Illustration | "Oh thanks dearest,"; Patient says with appreciation, friendliness, and calmness." ;You're welcome. It was nothing,"; C replies with warmth and energy. "It was a lot for me", Patient says with satisfaction pg 428   |
| Finding 4    | People with Dementia seem to understand the context of the text  |
| Illustration | When one of the caregivers sang the waltz ";Kostervalsen"; (the Koster Walz) whos last line is s proposal of marriage, the person with dementia responded in a playful manner ";Maja, sweetheart, hey do you want to marry me?; Carer sings the words to the song, sounding open playful and rhythmic. Patient laughs in a delighted manner, and then happily replies ";Ok. I'll do that";.pg 428  |

Götell et al. 2007<sup>[35]</sup> provide evidence of both effectiveness and appropriateness with an overall reduction in restiveness to care in the residents who had the experience of singing while having care attended to.

#### 4.3.2 Quantitative studies

***Ballard et al. 2002 [41] Aromatherapy as a safe effective treatment for the management of agitation in severe dementia: The results of a double-blind, placebo-controlled trial with Melissa.***

This study focused on the safety and effectiveness of using aromatherapy in managing agitation in people with dementia. This study was carried out in the United Kingdom and focused on 72 people residing in National Health Service aged care facilities. The people selected had clinically significant agitation levels as assessed and reported using Cohen-Mansfield Agitation Inventory Score (CMAI) and Neuropsychiatric Inventory (NPI). These subjects were randomized into either a treatment or a control group. Melissa oil which is a combination of *Melissa officinalis* (lemon balm), lavender, chamomile, valerian and verain, combined with a base lotion at a weight of 10% of the base lotion the same ratio was used on the control group with the base lotion combining with sunflower oil at the same ratio. The treatment group had a median CMAI score of 65.0 while the placebo group had a median CMAI score of 58.0. 200mls of the Melissa oil lotion and the placebo lotion was prepared at the beginning of the trial and a dose of 0.16-0.17g was administered from a pump pack to the patients face and both arms twice a day for a total of six doses per day which was administered by care workers. The trial was conducted over a four-week period. The outcome measures were assessed using CMAI and the NPI scoring systems. Statistical significance was assessed using the Mann-Whitney U test.

The authors of this study showed a reduction in median CMAI score of 22 points in the control group compared with the treatment groups reduction of 6.5 points, suggesting that Melissa oil is effective at reducing agitation in people with dementia over the four weeks of the trial. The authors also broke down the domains of the CMAI score to illustrate that the areas of greatest improvement for the treatment group subjects. The domain that was most improved by the intervention was physical aggression which showed a decrease of 6 points and physical non-aggression a decrease of 9 points, in comparison to baseline. The control group reported a decrease of 3 and 2 points respectively in the same domains. The authors also reported a decrease in the NPI showing a decrease in irritability score of 3.0 points compared with the control group who showed no change. The study also reported that there were no side effects noted to this treatment and the intervention was well tolerated by the staff and the residents, which indicates that it is also an appropriate intervention delivered in the context of residential aged care.

In summary, this study has shown that the use of aromatherapy utilizing Melissa oil can be an effective and appropriate strategy for the management of agitation behaviours in persons with dementia in a residential care setting.

***Brodaty et al. 2005 [38] Risperidone for psychosis of Alzheimer's disease and mixed dementia: Results of a double blind placebo controlled trial.***

Brodaty et al. 2005 [38] aimed to evaluate the effectiveness of low dose risperidone 0.25mg-1mg twice daily in the management of psychosis as a manifestation of BPSD over 12 weeks. Outcomes were assessed at two weekly intervals throughout the trial. 93 patients recruited from nursing homes and long term care facilities in Australia and New Zealand with a similar stage of illness as determined by pre-screening. This study endeavored to limit this study to include subjects with a previous diagnosis of Alzheimer's disease or mixed dementia and excluded subjects which had a neurological, medical or psychiatric disorder that would produce psychotic symptoms. The subjects included in this study had a Functional Activity Staging Test (FAST) score of  $\geq 4$  and a Mini Mental State Examination (MMSE) of  $\leq 23$ . They also had evidenced symptoms of aggression as assessed by the CMAI scale for frequency and severity. The subjects were also assessed for their tolerance to medication and their receptiveness to taking risperidone. Subjects who either had a sensitivity or were proven to not be responsive to risperidone were excluded. The final criteria for the subjects to be included in the study, was a score of 2 on the Behavior Pathology in Alzheimer's disease Rating Scale (BEHAVE-AD) psychosis subscale for any of the criteria, indicating the presence of active psychosis in a subject with dementia displaying aggressive behaviours. The study enrolled 337 patients with only meeting the criteria and then 93 patients being randomized into groups, 46 for risperidone and 47 for placebo. The risperidone group received twice daily doses of 0.25-1mg as a flexible dose compared to the placebo group which received no risperidone. The mean age for the subjects was  $83.5 \pm 7.1$  years the group was predominantly female ( $n=79$ ) and Caucasian ( $n=92$ ). The study had a seven day washout period to ensure that the patients were able to participate in this study. After this assessment 17 patients randomized to the placebo group and 18 randomized to the placebo group. The MMSE scores was  $5.7 \pm 5.67$  for both groups and BEHAVE-AD scores of the control group was  $9.3 \pm 5.8$  and the risperidone group  $9.3 \pm 5.7$ . The outcome data was measured with the Clinical Global Impression of Severity (CGI-S) and the BEHAVE-AD scale. The study showed that there was a reduction in psychotic symptoms with risperidone with an endpoint result evidenced in the BEHAVE-AD Scores being  $-5.2$  for the risperidone group and  $-3.3$  for the placebo group with a p value of 0.039 and a total effect size of 0.31. There was also evidence of improved global functioning with the risperidone subjects on the CGI-S with improvement being shown in 59% of intervention participants compared with 26% improvement in the placebo group. Brodaty et al. 2005[38] did not attempt to explain the improvement noted in the placebo group. A secondary and unexpected finding reported by this study was the high rate of adverse events. In total, fourteen patients experienced adverse events in the placebo group and 22 in the risperidone



group through the entire study. These adverse events were injury, constipation, agitation, somnolence, fall or urinary tract infection. It was noted that injury occurred in 50% of participants and somnolence evident in 43% of participants in the risperidone group. There were adverse effects reported in the placebo group with Injury in 36% of participant's agitation in 32% of participants and constipation in 30% of participants. Overall there was a lower rate of reported adverse effects reported in the placebo group over the control group in the 12 weeks.

Brodaty et al. 2005<sup>[38]</sup> concluded that that Risperidone is effective in the management of moderate to severe psychosis but benefit and risk needs to be incorporated into the decision making process.

***Crotty et al. 2004<sup>[28]</sup> An Outreach geriatric medication advisory service in residential care: A randomized controlled trial of case conferencing.***

Crotty et al. 2004<sup>[28]</sup> investigated the impact of multidisciplinary case conferencing on the appropriateness of medication use on patient behaviours in residential care. Ten facilities were recruited in the southern suburbs of Adelaide South, Australia. These facilities then asked to select patients who they would like assistance in managing, with the stipulation that the patient had to be taking five or more medications. The facilities were randomized to two groups one a control group of five facilities and the intervention group of five facilities. The control group had 54 residents from the five facilities. The intervention group had five facilities of which 100 residents were selected and then they were randomly assigned to an intervention group or a control group within the facilities. The staff of all ten facilities attended a behavioral workshop after which base line data was collected on all 154 residents from across the ten facilities. This base line information was mean age percentage of male residents, alive at follow up, diagnosis of dementia and of depression, presence of anxiety/agitation/aggression, number of medications, Medication appropriateness index (MAI) and nursing home behavioral problem score (NHBPS). Of this data, all groups were of comparable age number of medications prescribed, rates of dementia, depression and anxiety levels. MAI score for the control group was 4.1 (2.4-5.7) compared to the within facility control score of 6.0 (3.1-9.0) and treatment 7.4 (4.5-10.3) with a confidence interval of 95%. This showed that the treatment group was in the position of having a greater number of inappropriate medication use which could be a potentially confounding factor. The intervention of the case conference was applied to 50 residents in the within facility treatment group. Of the 154 residents that commenced this program 39 completed from the control group, 32 from the treatment group and 38 from the within facility control group. The case conference was held with the general practitioner, a geriatrician, a pharmacist, a representative of Alzheimer's Australia and care staff from the residential care facility. The most common problem discussed was aggression/ agitation/ anxiety (17 out of 50

cases). At the completion of the 12 week trial there was no difference in NHPBS across the groups ( $p=0.440$ ). There was a significant difference in the MAI score between the groups with the intervention group changing to 3.5 (1.4-5.6) evidencing a total change of 4.10 (2.11-6.10) compared with total change for the, with in facility control of -0.12 (-1.41-1.17) and control group change of 0.41 (-0.42-1.23). This showed the effectiveness in optimizing medications with case conference but it was noted that the case conference effect did not influence the outcomes of the residents who were not directly involved.

Crotty et al. 2004<sup>[28]</sup> shows the effectiveness of case conference in the reduction of inappropriate medication usage. Improved medication appropriateness was only seen in the residents who were discussed at the case conference. In the 12 weeks of this study there was no change in NHPBS scores in these groups suggesting that medication appropriateness does not directly relate to the prevalence of behaviours in residential care.

***Pollock et al. 2007<sup>[37]</sup>, A double-blind comparison of citalopram and risperidone for the treatment of behavioral and psychotic symptoms associated with dementia.***

Pollock et al. 2007<sup>[37]</sup> measured the effectiveness of citalopram against risperidone in the management of BPSD. This trial was conducted at the University of Pittsburgh medical center psychogeriatric ward where prior to discharge 111 participants were screened and 103 consented and were randomized into this study which was carried out over 12 weeks. The study sample had comparable characteristics of behavioral symptoms and cognition on entry as assessed with the MMSE, Cumulative Illness Rating Scale- Geriatrics score, Severe Impairment battery, Neurobehavioral rating scale (NBRS), Neuropsychiatric Inventory (NPI) and Udvalg for Kliniske Undersogelser (UKU) scoring systems. Gender was notably different between the two groups: the risperidone group comprised of 76% women and the citalopram group of 47.2% women. This difference was factored into mixed model analysis and gender as an effect was shown not to influence the data at base line. The citalopram group contained 53 members and the risperidone group 50. The citalopram group was given a daily dose of 10mg of citalopram, while the risperidone group received 0.5mg starting with one capsule at bed time for three days followed by two capsules per day with titration to effect over the following weeks. Of the citalopram group, 15 dropped out before returning to their homes and 19 withdrew from the risperidone group. Reasons for the withdrawals were reported as being intercurrent medical problems, adverse events, psychiatric worsening and administrative reasons. At the conclusion of the study, 25 completed treatment in the citalopram group and 20 in the risperidone group. The participants were assessed using the UKU and NBRS scoring systems. The NBRS and the UKU scores did not differ greatly for both groups with a 32.3% reduction in psychosis in the citalopram group and 35.2% reduction in the

risperidone group. There was a 12.5% reduction in agitation scores with the citalopram in contrast to an 8.2% reduction with risperidone. A further interesting result was in the side effects that were exhibited by each drug group. The citalopram group showed a 26.2% decrease in sedation while the risperidone showed an 83.3% increase in sedation. This increase in sedation makes the resident more susceptible to falls and unable to interact with their environment. Both drugs showed an increase in extrapyramidal symptoms (EPS) 87.5% citalopram and 102.5% risperidone as measured pre and post against the domains of rigidity and tremor in the UKU scale.

Pollock et al. 2007<sup>[37]</sup> conclude that as citalopram is better tolerated as evidenced by the decreased level of sedation making it potentially more appropriate than other agents (such as risperidone) in the management of BPSD.

***Luttenberger, K 2012<sup>[43]</sup> ,Effects of Multimodal Nondrug Therapy on Dementia Symptoms and Need for Care in Nursing Home Residents with Degenerative Dementia: A Randomized-Controlled Study with 6-Month Follow-Up.***

In the study by Luttenberger et al. 2012<sup>[43]</sup> the researchers aimed to determine the effectiveness of an activity and stimulation approach to managing clients with dementia and improving functional ability as evidenced in improvement in functional ability measure scores. Multimodal or multi component therapy is known as MAKS therapy, the M stands for motor stimulation, the A stands for activities of daily living, the K is from the German word *kognitiv* meaning cognitive stimulation and S stands for short introductory phase or spiritual element. The study was conducted in Germany and 646 individuals were screened with 146 being eligible for the trial and 130 included in the intention to treat analysis. Of this group 70 were allocated to the control group and 71 to the treatment group 66 were in the control intention to treat group and 64 in the treatment intention to treat group. Of the subjects lost each group had a subject die before the trial commenced. From the control group after the intervention started one was excluded as they were bed ridden, three died and one moved away, whilst in the treatment group, three refused therapy, nine were hospitalized, two died and one moved away. The treatment group received the intervention of 10 minutes of introduction, 30 minutes of motor exercise such as bowling, croquet or balancing a ball then a 10 minute break followed by 30 minutes of cognitive exercises such as picture puzzles or paper and pencil tasks. This was followed by 40 minutes of attempting activities of daily living (ADL) tasks such as preparing a snack or a creative task such as working with paper or wood. The subjects in the treatment group were free to participate in the facilities' normal activities and also received the usual care given to the control group. This study was carried out over six months. Both groups were comparable at entry in demographics and clinical and cultural background. The

participants were assessed using the Nurses Observation Scale for Geriatric Patients (NOSGER) scale the Barthel index and the Resource Utilization in Dementia – Formal Care (RUD-FOCA). The assessments were broken down for comparison of the different domains and compared using paired-sample test. The Barthel scoring system is an assessment of ADL ability and the RUD-FOCA is an assessment which looks at the time taken to provide care to residents. The NOSGER is an observation scale which details the overall symptoms of dementia.

A significant area of difference between the two groups was in the subscales of mood and memory at the completion of the study as scored on the NOSGER scale, Mood 5.3 (2.2-8.3) Difference (95% CI)  $t=2.98$   $p=0.005$  in the MAKS Groups vs. the control group's mood -1.0 (-2.9-0.9) Difference (95% CI)  $t=0.29$   $p=0.77$ . Memory showed 1.5 (0.63-2.33) Difference (95% CI)  $t=3.49$  P value .001 in the MAKS Groups vs. the control groups mood 0.3 (-0.37-0.91) Difference (95% CI)  $t=0.84$   $p=0.41$ . Another area of significant improvement was in the challenging behaviours which is best looked at through the clinical relevance. The MAKS group showed significant improvement over the control group on the NOSGER scale in all social and behavioral domains. This was determined through a relative advantage score in the treatment group of 9 in helping others and running away and 6 in remembering conversations. The ADL domains also showed improvement on the NOSGER scale with a relative advantage of 22 in the areas of shaving and hair combing a score of 10 for being able to follow a television program. Scores of 7 were achieved in the domain of appropriately addressing others and a score of 5 in tidying up room. There was a modest relative advantage in all other domains. The second hypothesis of the authors was that the use of MAKS would decrease care time this was not shown to be true.

Luttenberger, K 2012<sup>[43]</sup> concludes that through the use of a structured activity regime there can be effective management of behavioral symptoms of dementia as well as the opportunity for functional improvement.

***Ruths, S et al. 2004<sup>[40]</sup> Effect of antipsychotic withdrawal on behavior and sleep/wake activity in nursing home residents with dementia: A randomized, placebo-controlled, double-blinded study: The Bergen district nursing home study***

The study by Ruths et al. 2004 <sup>[40]</sup> examined the effects of ceasing long term anti-psychotic medication and the effects on BPSD. The study was conducted in nursing homes in, Bergen Norway and had 55 participants who were taking haloperidol, risperidone or olanzapine for BPSD. These participants were randomly assigned with 28 in the reference group and 27 in the intervention group. The subject groups were comparable at entry with mean age for the intervention group 83.6 and 84.6 for the reference group. The percentage of participants taking each risperidone, haloperidol and olanzapine were similar,

with risperidone being the most used drug in both groups with 63% in the intervention group and 86% in the reference group. The study used the Neuropsychiatric inventory (NPI) to report the base line and follow up levels of dementia. The total NPI score and standard deviation for the intervention group 8.6 (5.1) and 7.9 (3.3) for the reference group. The intervention group was given placebo capsules instead of their current anti-psychotic medication while the control reference group was continued on their current dose of anti-psychotics. The study was conducted over four weeks and observations were taken at week one and at the conclusion of the study. The observations were no different from the base line levels reported at one week. At the conclusion of the study there was a reduction in total NPI score of -0.19 (5.3) in the intervention group and -1.79 (4.9) for the reference group. The results were analysed using an analysis of variance in this analysis there were no significant differences in the NPI over the 4 week period. At the study's completion 23 of 27 of the intervention group remained off antipsychotic medications and three months after the completion of the study 8 of 24 remaining intervention group remained off antipsychotic medication.

Ruths et al. 2008 shows that discontinuation of antipsychotic medication is not detrimental to the resident and that stopping long term therapy can be successful as determined by a reduction the NPI score in a majority of cases.

***Frank, L, et al.2004,<sup>[39]</sup> The effect of risperidone on nursing burden associated with caring for patients with dementia.***

This study conducted By Frank et al. 2004<sup>[39]</sup> was conducted in Australia and New Zealand looking at the impact that risperidone had on the carer burden, as assessed using the Modified Nursing Care Assessment Scale (M-NCAS). This study enrolled 337 residents of long term care facilities and nursing homes. Of the 337 enrolled 279 residents were randomized into two groups: 170 to a placebo group and 167 to the risperidone group. The participants given the risperidone were given 0.25mg of oral solution twice a day with the dose adjusted in 0.25mg increments based on investigator judgment to a total dose of 2mg per day. The placebo group received an oral solution in equal qualities. This study was carried out over 12 weeks with assessments at baseline, four weeks, eight weeks and endpoint. The base line assessment groups had comparable characteristics in relation to age, race gender and diagnosis. The participants and the staff who care for them had baseline M-NCAS on entry, and the care recipient participants also had CMAI and BEHAVE-AD done so to correlate with the M-NACS. The study reported M-NCAS score change risperidone verses placebo, square means and 95% confidence interval which evidenced significant reductions in the risperidone group in two of the attitude sub scales; difficulty and attention seeking and three of the strain scales affect, job satisfaction and neediness. This

was also reflected in the M-NCAS score changes risperidone verses placebo week 4, week 8 and week 12. The study also showed Pearson Product-movement correlation between the CMAI and the M-NCAS total subscale scores for the attitude and strain domains of the M-NCAS at base line, this showed significant strains in the areas of physical aggression verbal aggression and verbal non-aggression. Separately to the placebo risperidone study results another observation was taken that was of the effect size of the non-responders and responders to treatment. These subjects had to show a change in the mean baseline CMAI of 4 points in the total aggression subscale to be classified as a responder to treatment; the remaining subjects were classified non responders. This was not dependent on the subject having the intervention; it only looked at total improvement of the subject and then grouped them based on this total improvement. This obviously showed an increase in the effect in all domains of the responders compared to the non-responders. This section speaks to the perception of the staff This section is important in the interpretation of strain on the staff as it does not relate directly to the administration of the treatment but to the perception of the impact of the treatment be it present or not. So it was irrelevant if the person had received risperidone, the important factor for staff is there was perceived improvement due to the intervention and this alleviated some of the burden of caring for the staff.

Frank et al. 2004<sup>[39]</sup> shows that the risperidone treatment of residents with BPSD changes the perception of the staff providing care to them. This reduction in perceived burden improves quality of care that is delivered which speaks to the impact of risperidone or the pre conceived notions of the nursing staff to the effects that risperidone can have..

***Peskind, E.R., et al. 2005,<sup>[42]</sup> Propranolol for disruptive behaviours in nursing home residents with probable or possible Alzheimer disease: A placebo-controlled study.***

The objective of the study by Peskind et al. 2005<sup>[42]</sup> was to assess the use of propranolol in the management of BPSD in residential care facilities. This study was conducted in nursing homes in Washington in North America. The study consisted of 31 frail aged subjects which were administered either propranolol or a placebo. There were 25 women and 6 men with a mean age of  $85 \pm 7.8$ ). The group was randomized with 17 subjects receiving the propranolol and 14 in the placebo group the subjects remained on their usual medications (which included anti psychotics and anti-depressants). The subjects had total NPI scores of  $25.5 \pm 15.6$  for the propranolol group and  $29.5 \pm 15.5$  for the placebo group. The dose of the propranolol was augmented to effect and began with a dose of 10mg three times per day. The mean augmented dose was  $106 \pm 38$ mg per day. The behaviours were measured using the NPI and the clinical global impression of change (CGIC). The CGIC is an overall

measure of effectiveness. This study although small showed a significant decrease in agitation and aggression in subjects receiving propranolol  $t = 1.96$ ,  $p=0.06$  and a decrease in anxiety  $t = 0.98$   $p=0.33$ . The overall CGIC suggested that the use of propranolol was effective with a score of  $3.0 \pm 1.8$  as opposed to the placebo group which was  $4.5 \pm 2.4$ . This study was part of a one year longitudinal study of nursing home residents maintained on antipsychotic drugs, the longitudinal study was not reported but the observation was made that the antipsychotic medication did not seem to prevent the presence of disruptive behaviours.

Peskind et al. 2005<sup>[42]</sup> demonstrated modest effectiveness with the use of short term augmented propranolol. Peskind et al. 2005<sup>[42]</sup> highlighted that the use of propranolol on frail aged people may be useful over a short time, but asserts that the effects will diminish and in the long term be ineffective.

***Cohen-Mansfield, J. et al. 1998,<sup>[44]</sup> The effects of an enhanced environment on nursing home residents who pace.***

Cohen-Mansfield et al. 1998<sup>[44]</sup> conducted this study in Washington, North America in a large not for profit nursing home which had two relatively equivalent corridors based on building design. There were 27 nursing home residents with a mean age of 84.4 years; 21 of these participants were female. The residents all exhibited wandering behavior and were rated as pacing or wandering several times a day on the CMAI scale. The participants were also assessed for their ability to perform activities of daily living on the Physical Self Maintenance Scale (PSMS) which the mean score for participants was 2.8. A score is given where 1 is independent and a score of 5 completely dependent. Cognitive levels were also assessed using the Brief Cognitive Rating Scale this 7 point scale has 1 as normal function and 7 as complete cognitive deterioration the mean score was 5.0. The intervention was to observe the residents behavior when the corridors were decorated differently. There were three different presentations of the corridor 1) the usual corridor with no decoration, 2) nature scene and 3) home scene. The nature scene had a range of plants and posters depicting nature scenes. It also had an olfactory component using aroma diffusing machines. A corridor was prepared as a home scene with wall posters of familiar people from the 1940s and 1950s with period radio, classical music and a citrus aroma. For this scene an arm chair and a coffee table was provided to add to the home like atmosphere. For both corridors benches were placed opposite some of the posters in order to allow people to sit and look at them. The residents were observed for 12 hours in the day with the participants being observed for 3 minute intervals. The residents were observed for exit seeking behavior, agitation physical and verbal, and effect on mood, preference regarding scenes of residents, relatives and staff. The study showed that the residents preferred the enhanced environments spending more time in the corridors

and there was a lower overall incidence of exit seeking behavior and a greater amount of time sitting. The sitting time increased from 24.25 to 33.14 observed 10 second intervals for the home scene and 20.41 to 23.76 observed 10 second intervals in the nature corridor. The majority of the 29 staff members who worked in the unit 52% preferred the nature scene, 17% the home scene and 31% preferred both scenes equally. The resident's preference was based on which scenes were visited most in the observational phase of the study and there was no difference in these visits. The relatives liked the enhanced environment and felt it was beneficial to their family member in care. It was reported that the enhancements to the corridors were not expensive to put in and the scenes set up easily. This speaks to the ease of implementing such an intervention.

Cohen-Mansfield et al. 1998<sup>[44]</sup> reported that enhanced environments were effective and appropriate in managing residents who pace. It also found that this is an appropriate practical intervention which has a benefit for all who come into and work in the residential care facility.

***Cohen-Mansfield, J. et al. 2010 <sup>[46]</sup>, Can agitated behavior of nursing home residents with dementia be prevented with the use of standardized stimuli?***

In this study by Cohen-Mansfield et al. 2010,<sup>[46]</sup> 111 residents of nursing homes in Maryland, North America were observed engaging with predetermined stimuli. These stimuli were music, social stimuli, simulated social stimuli and individual stimuli based on the person's self-identity. The engagement was observed and the number of agitated behaviours documented. All of the participants were exposed to the 25 predetermined stimuli (four per day over a three week period). The participants were divided into quartiles based on their agitation levels measured with the CMAI at the base line assessment. The subjects were observed for agitated behavior (physical and verbal) and a total agitation score was also determined and this was measured with the Agitation Behavior Mapping Instrument (ABMI). A mean rank score was also determined and this showed an improvement from the base line with all interventions with the most significant reductions being in the area of live social engagements. Live social engagement such as a real baby doll, a real dog and one on one socializing's effect on total agitation, physical agitation and verbal agitation was the most effective. A set task had a similar but less engaging effect as did reading self-identity and music. There were smaller improvements in work, simulated social situations and manipulative tactile tasks in all three domains. The study reported that there was a better response to an activity that was akin to the subjects experiences. It found that the more familiar the task the better the subject engaged with it a subject who for example identified as a home maker found folding towels a meaningful activity whereas sorting envelopes was meaningful to a person who worked in an office. This result was reported anecdotally and no statistics were provided to



support this. It was discussed that the provision of a range of different stimuli which had a social component were beneficial in the reduction of BPSD. It also found that educating staff in the importance and application of appropriate stimuli for residents in aged care.

The use of stimuli is appropriate and effective in managing behaviours in residential care as evidenced in this study by Cohen-Mansfield et al. 2010<sup>[46]</sup>.

***Cohen-Mansfield, J, et al. 2009<sup>[48]</sup>, The impact of stimulus attributes on engagement of nursing home residents with dementia.***

Cohen-Mansfield et al. 2009<sup>[48]</sup> examined the type of work stimulus and manipulated block stimuli that engages the resident. This study was conducted in Maryland, North America with 69 nursing home residents with dementia. There were 11 engagement stimuli which consisted of work related stimuli such as sorting and stamping and block related stimuli which involved manipulating organizing and stacking the blocks of different size shape texture and color. The residents were observed throughout the three to five minute interaction time with each activity. The residents were observed for their level of engagement on a 7 point scale for attitude ranging from very negative to very positive. Attention was assessed on a 4 point scale which went from non-attentive to very attentive. Inter-rater reliability was also assessed at 69% for exact matches and 84% for within one class. The study found that attention and attitude were highest for work related stimuli with a mean duration of 266.10 seconds and an attitude score of 4.99. The study also addressed the impact of different size and texture of blocks and fabrics which showed no overall difference in engagement in duration attention and attitude towards the task. The study also examined the effect of sorting and stamping activities which also showed significant engagement, 260.81 seconds for stamping and 233.79 seconds for sorting and an overall positive attitude score of 4.96 for stamping and 4.81 for sorting.

Cohen-Mansfield et al. 2009<sup>[48]</sup> shows through high positive attitudes scores of residents and the length of time that the residents is constructively engaged that work related stimuli is effective and appropriate to engage residents with BPSD.

***Cohen-Mansfield, et al. 2012,<sup>[53]</sup> What Are the Barriers to Performing Non-pharmacological Interventions for Behavioral Symptoms in the Nursing Home?***

This study conducted by Cohen-Mansfield et al. 2012<sup>[53]</sup> was conducted across six nursing homes in Maryland, North America and included 89 residents. This study looked at the barriers to the provision of non-pharmacological interventions by assessing the implementation of personalized agitation protocols. These personalized agitation protocols were taken from the Treatment Routes for Exploring Agitation

(TREA) decision tree protocol which attempts to address the residents unmet needs which some suspect to be a cause of some unwanted behaviours. These interventions were assessed through direct observation by research assistants, interviews with staff, questionnaires and chart review. The activities that were offered fit with the resident's cognition, sensory deficits and mobility. The activities were also tailored to indicate past preferences and best fit with the resident's past identity. The activities used were sensory stimulation e.g., music, perfume, simulated social stimuli e.g. family videos, pictures, one on one socializing with the research assistant, activities e.g. sorting cards, art and crafts, care related requests e.g. responding to residents requests to go to the toilet and requests for food and drink. The study broke down the types of activities offered and the most regularly offered activities were the simulated social activities offered 378 times, followed by physical activities 188 times, then arts and crafts 136 times, care related activities 133 times and then magazines/ reading/ books on tape at 132 times. The highest rates of explicit refusal was in the area of puzzles and board games 19.32% the lowest explicit refusal rate was for watching movies or DVDs 3.3%. This study also looks at the level of impairment and how that relates to the explicit refusal rate. It showed correlation between the base level of impairment and agitation and the rate of explicit refusal to activities. This study states that the activities that had the lowest total refusal rate was one on one socializing, provision of food and drink. The study also reported that the resident was not available 46.1% of the time that the non-pharmacological intervention was attempted due to the provision of care or the resident being with family, eating, sleeping or involved in another activity.

Cohen-Mansfield et al. 2011<sup>[53]</sup> the use of non-pharmacological interventions such as one on one socializing or offering food and drink ,is an easily administered and well tolerated activity for residents. When activities are administered they need to be within the resident's cognitive, sensory and mobility capabilities.

***Cornegé-Blokland, et al. 2012<sup>[52]</sup> Reasons to Prescribe Antipsychotic for the Behavioral Symptoms of Dementia: A Survey in Dutch Nursing Homes among Physicians, Nurses, and Family Caregivers***

The study conducted by Cornegé-Blokland, et al. 2012<sup>[52]</sup> aimed to address safety concerns over the prescription rates of antipsychotic medication for BPSD. This study was conducted across 23 nursing homes in the Netherlands. The study took the form of the interview asking a structured questionnaire to the physicians and nurses that work in the facility and a family member of the person with dementia. The questionnaire had case related questions which looked at the experience of the physician and antipsychotic medication use in general and the reasons that they were prescribed. Of the 27

Physicians contacted, 60% stated that if a patient was suffering with BPSD and there was no alternative they would prescribe an antipsychotic medication. 28% of physicians believed that non-pharmacological interventions were perceived insufficiently by nursing staff of the facility. Statements were also made around insufficient staffing and the need for better education on non-pharmacological interventions. The care related opinions focused on the experiences in managing specific cases in 37 cases presented the main reason for the prescription of antipsychotic medication was aggression and agitation. The study showed that the nurses were the main factor in the use of the medication in 67% of cases, it was a physician's initiative on 21% of cases and directed by the family in 11%. It was considered that the nurse's influence was the most significant on the physician in the prescription of antipsychotic medication. The estimated success rate in managing behaviours with medication was seen to be comparable at 50%, 53% and 55% of the time by the physicians, nurses and family members. There was a discrepancy in the perception of side effects of the medication with nurses underestimating the impact on the patient in the prevalence of falls, sedation and Parkinsonism as compared to the physician estimates.

Cornegé-Blokland, et al., 2012<sup>[52]</sup> reports that the rate of anti-psychotic drugs would be less if there were more education on BPSD, and education and guidelines for the implementation of non-pharmacological strategies.

***Ervin, et al. 2012 <sup>[26]</sup> The management of behavioral problems associated with dementia in rural aged care.***

The study by Ervin et al. 2012<sup>[26]</sup> was conducted in rural Australia and aimed to assess the knowledge and strategies that are used to manage behaviours in rural Australian facilities. This was done through the use of a survey of nursing staff in six facilities and used a 43 question survey and scenarios to gauge responses. There were 130 nurses that responded to this survey which was an even mix of registered nurses, enrolled nurses, personal care attendants and nursing students. On the overall management of dementia from scenarios, 90% and 84% respondents said that they would exclude delirium first, 27% and 20% would employ an antipsychotic medication, but all agreed that non pharmacological management is the least invasive and therefore appropriate and should be explored. The participants were asked about the limitations on pharmacological management, 37% cited adverse drug reactions as a reason not to use antipsychotic medication, 23% stated residents refusal of the medications was a reason they would not give it, 23% felt they were not effective and 23% said they had insufficient knowledge to administer antipsychotic medication. Of the non-pharmacological strategies the strategies were grouped into four categories behavior, cognitive, stimulation and emotion. Emotional support was

seen as the most effective method for managing behaviours effective 74% of the time and employed daily by staff 63% of the time. Behavioral therapy was the most frequently used intervention, used daily by 89% of respondents with a 66% likelihood of this therapy being effective. Pharmacological interventions were only seen to be likely to be effective 24% of the time. Appropriateness of the interventions was also assessed via the scenario, based on the perception of the person undertaking the survey; and it was not discussed or could not be determined if appropriateness related to the resident or what suited the staff. It was seen that 56% of respondents believed that pharmacological interventions were appropriate for severe BPSD. All of the non-pharmacological interventions were deemed to be appropriate for the subjects of the scenarios by 70% of respondents. Of the respondents 85% had not heard of the dementia advisory service and have not sought additional assistance in managing difficult behaviours. The dementia behaviour advisory service is a service available in Australia to assist in the management of challenging behaviours in commonwealth funded aged care facilities. This service offers advice, education and resources to assist in the management of residents.

Ervin et al. 2012<sup>[26]</sup> concludes that for effective and appropriate management of BPSD there needs to be more education of staff into management strategies for BPSD.

***Ramadan, F.H et al. 2003<sup>[47]</sup> Correlates of Behavioral Disturbances and Pattern of Psychotropic Medication Use in Five Skilled Nursing Facilities.***

This study by Ramadan et al. 2003<sup>[47]</sup> was conducted in New York State. It was conducted over five skilled nursing facilities with 431 residents. There were 117 as a treatment group who exhibited clinically significant behaviours. Having a clinically significant behavior was defined as scoring greater than 4 episodes on the Behavior Measurement scale categories (BMS) per week. The BMS is derived from the CMAI and rates only behaviours and has no psychiatric component. This study examined whether there was a correlation between behaviours exhibited and the psychotropic medication that was used to manage those behaviours. A random sample of 116 residents was taken as a control group which did not exhibit BPSD behaviours or had recorded fewer than 4 episodes per week on the BMS scale.

The study looked at behaviours as verbally aggressive, verbally non aggressive, physically aggressive and physically non aggressive. In the study treatment group there were 15 clusters of these behavior types in the 117 residents. The clusters were based on the patterns that behaviours occurred each resident. The subgroups which made up the clusters were verbal aggression, verbally nonaggressive, physically aggressive and physically non aggressive these sub groups or traits were grouped singularly as in one behavior or with two three or four other behavior types. The most prevalent behavior type was verbally nonaggressive behaviour 20.5% of participants, followed by 17.9% residents who displayed all

the behavior traits; and then 14.5% of residents who were both verbally and physically non aggressive. Of the treatment group, 27% of the subjects with a clinically significant behavior received a neuroleptic medication and 15% received a benzodiazepine. Of the subjects in the significant non behavior group benzodiazepines were used in 3% of subjects and neuroleptic medication in 14%. Interestingly, the use of antidepressants was 17% in the behaviour group and 22% in the non-behavior group. There was no correlation between the medications and the behaviours, leading the authors to suggest that prescription was due to local variances and prescriber's preference.

Ramadan et al. 2003<sup>[47]</sup> reported that BPSD is managed with medication in an *ad hoc* fashion and management with medication is based on each clinician's experience in the absence of treatment guidelines.

***Khan, et al. 2011<sup>[51]</sup> Non-pharmacological management of behavioral symptoms of dementia***

Khan et al. 2011<sup>[51]</sup> examined the effectiveness of using a multi-disciplinary mental health team as an in-reach service to assist with instituting non-pharmacological interventions in care facilities. The study utilized several questionnaires to gauge knowledge and confidence in managing BPSD, both at base line and at the end of the program. The staff were questioned on their base line knowledge of dementia, mental health issues, and strategies for managing behaviours and how to access support for staff in managing BPSD behaviours. This study reported a work force that felt confident with their jobs and managing dementia and BPSD in their patients with most responses being scored as good or excellent more than 60% for all questions. After the intervention, the responses for the same questions were mixed, with respondents indicating that they had an improved knowledge of mental health problems but a decreased knowledge of dementia. It was suggested that the variance between pre- and post- survey results showed that the education provided to staff had broadened their knowledge of dementia, thus revealing to them hitherto unsuspected gaps in their knowledge and the staff have more confidence with non-pharmacological interventions for BPSD after the education and they felt as if they had an excellent knowledge of managing BPSD with a non-medical approach. The multi-disciplinary team also conducted a medication appropriateness review and provided education around the use of medication for BPSD. This resulted in 15 medications stopped, 12 dosages increased, 8 dosages reduced and 36 new medications started. These changes made the staff more confident that the use of medication was now more appropriate.

Khan et al. 2011<sup>[51]</sup> demonstrates appropriate and effective management of BPSD through the use of expert clinicians' advice and mentoring to give staff the confidence to implement non-pharmacological strategies and manage medications in a more appropriate fashion.

***Pitkala, K.H et al. 2004<sup>[50]</sup>, Behavioral symptoms and the administration of psychotropic drugs to aged patients with dementia in nursing homes and in acute geriatric wards.***

This cross-sectional descriptive study involved interviews and observation of patients in seven acute wards of two geriatric hospitals and 13 wards of seven nursing homes in Helsinki, Finland. Pitkala, K.H et al. 2004 <sup>[50]</sup> aimed to find a correlation between behaviours and the use of psychotropic medication. There were 160 nursing home patients eligible for this study and 95 patients on the acute geriatric wards. Of the participants, delirium was found to be common with 43.2% of the patients on the acute ward with dementia having a delirium as well as BPSD. The nursing home population had a delirium rate of 15.6%. The behavioral symptoms were examined for the subjects with and without delirium across all the subjects. Psychotic symptoms were most prevalent in subjects with delirium; insomnia was also a significant problem, as was anxiety. In the group without delirium, depression and anxiety were the most common behaviours. The behavioral symptoms were also examined in relation to the prescribed medications. The study showed that 120 of the subjects were not using any medications for BPSD behaviours; the strategies used to manage these behaviours in these patients were not discussed in this study. The main finding was that patients who wandered and had insomnia were commonly prescribed psychotropic medication or restrained.

Pitkala, K.H et al. 2004<sup>[50]</sup> shows that there is little correlation between the medications used to manage BPSD and the symptoms that are displayed. This leads us to question the appropriateness of anti-psychotic medication usage in BPSD.

***Zuidema, S.U., et al. 2004<sup>[49]</sup>, Psychotropic drug prescription in nursing home patients with dementia: Influence of environmental correlates and staff distress on physicians' prescription behavior.***

This cross-sectional study conducted in the Netherlands by Zuidema et al. 2004<sup>[49]</sup> included 1289 subjects with dementia. This study was conducted over 56 dementia units across the Netherlands. The subjects were analyzed through a chart audit which looked at Global Deterioration Scale (GDS) score and the presence of neuro-psychiatric symptoms with the Neuro-psychiatric Inventory Nursing home version (NPI-NH). Information was also collected about the environment the subjects lived in; especially the number of people in each bed room and the number of people in each living room. There was also information collected concerning the medication prescribed. This information was further broken down into domains of staff distress, physical environmental correlates and neuro-psychiatric symptoms. The most significant findings were that agitation/dis-inhibition/irritability in the area of staff distress at patients OR=1.66 (95% CI= 1.16-2.36) and a statistically significant association with a resident receiving an

anxiolytic medication OR=1.62 (95% CI 1.01-2.61). In the physical environment domain the odds ratio of a subject requiring hypnotic medication increased with the amount of patients that used a living room OR=1.08 (95% CI 1.02-1.14). There was an association between the lower staff ratio units and a statistically significant association between delusions and hallucinations and antipsychotic prescription with an odds ratio of 1.60 (95% CI 1.01-2.53). There was also a statistically significant association between agitation/dis-inhibition/irritability and antipsychotic use with an odds ratio of 1.45 (95% CI 1.02-2.05). There was also shown to be a statistically significant association between hypnotics and sleep disturbance with an odds ratio of 2.04 (1.17-4.94). Antidepressants were prescribed 2.5 times more frequently (1.62-3.85) to subjects that were depressed and there was no association with antidepressants for subjects that showed agitation/dis-inhibition/irritability (OR=0.69, 95%CI 0.48-0.996)

The study by Zuidema et al. 2004<sup>[49]</sup> illustrates the effect of environmental factors on the prescription of medication for BPSD and the prevalence of symptoms. This study shows that the appropriate use of medication can be affected by the environment in which care is provided.

## 4.4 Synthesis of review findings

This section presents the synthesis of the qualitative and the quantitative data for management strategies utilized for the management of BPSD. Findings from the qualitative studies have been categorized on the basis of similarity of meaning and further grouped to generate two synthesized findings. The qualitative synthesis focuses on the use of music and singing in the management of clients. The qualitative meta-analysis is based on the use of risperidone in the management of BPSD.

The quantitative studies in this systematic review had many different treatment modalities and also used many different inclusion criteria and outcome measures making meta-analysis of all the quantitative studies not clinically useful or appropriate. However meta-analysis was appropriate for data from the two studies by Brodaty et al. 2005 and Frank et al. 2004.

### 4.4.1 Synthesis of qualitative evidence

Nine findings were extracted from the included qualitative studies. Eight of these extractions based on similarity of meaning, were categorized into two categories and then further grouped in order to generate two synthesized findings. Findings and illustrations from both included studies are listed in full in Appendix VI.

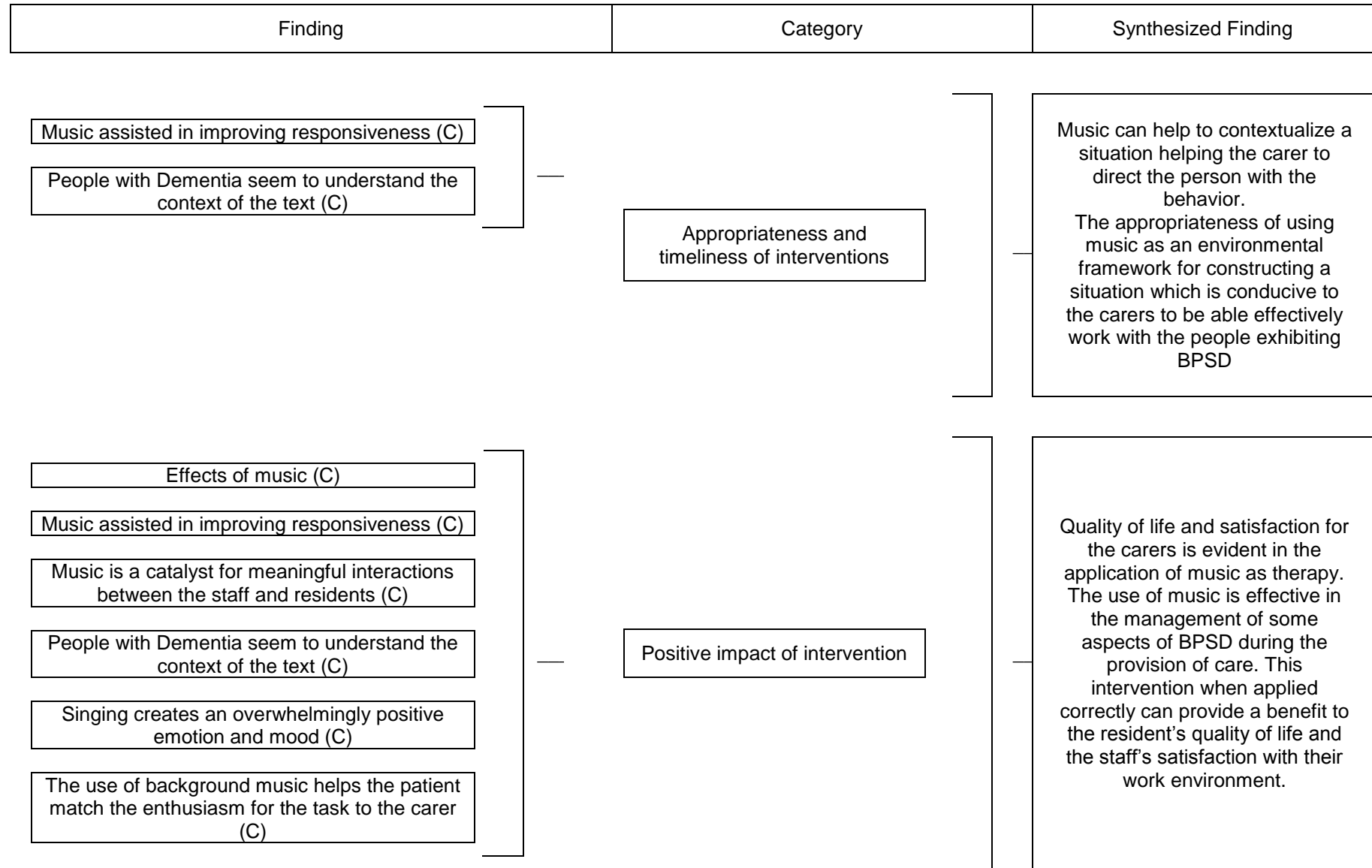
Levels of credibility are assigned to each finding on the basis of Joanna Briggs Institute criteria, shown below in table 7.

Table 7 Joanna Briggs Institute levels of credibility of qualitative evidence.

| Level of evidence  | Description   |
|--------------------|---|
| <b>Unequivocal</b> | Relates to evidence beyond reasonable doubt which may include findings that are matter of fact, directly reported/observable and not open to challenge.   |
| <b>Credible</b>    | Those that are, albeit interpretations, plausible in light of the data and theoretical framework. They can be logically inferred from the data. Because findings are interpretative they can be challenged. |
| <b>Unsupported</b> | Where neither 1 nor 2 apply and where most notably, findings are not supported by the data.   |



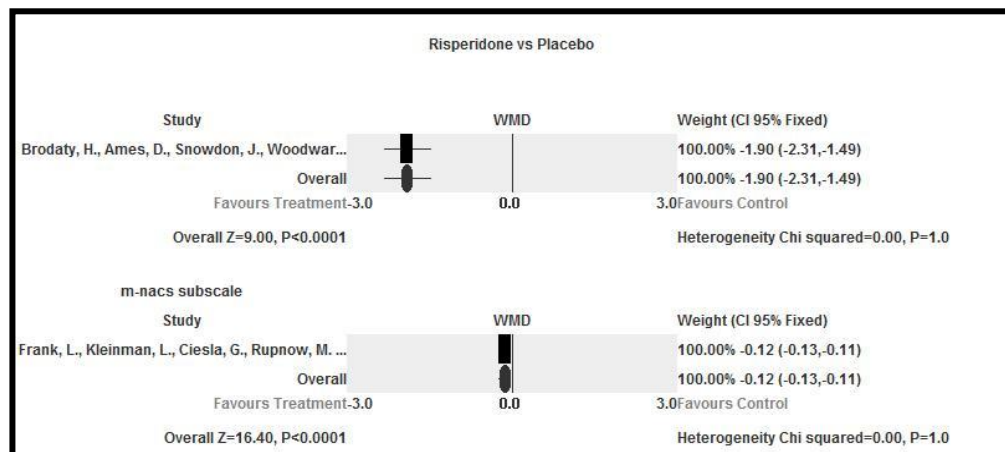
Figure 2 Synthesized Findings of Qualitative studies



#### 4.4.2 Synthesis Quantitative Data

Due to the lack of subject heterogeneity of the included studies a meta-analysis was not appropriate for all the quantitative studies in this systematic review, as can be seen in the characteristics of included studies table in Appendix VI. The only studies that were conducted in a similar fashion were that of Brodaty et al. 2005<sup>[38]</sup>, Frank et al. 2004<sup>[39]</sup> and Pollock et al. 2007<sup>[37]</sup>. These three studies look at Risperidone use Brodaty et al. 2005<sup>[38]</sup> and Frank et al. 2004<sup>[39]</sup> against placebo and Pollock et al. 2007<sup>[37]</sup> looked at the effectiveness of risperidone against citalopram. Meta-analysis was possible for the Brodaty et al. 2005<sup>[38]</sup> study and the Frank et al. 2004 study <sup>[39]</sup>. The study by Pollock et al. 2007<sup>[37]</sup> was not included as the citalopram was an effective agent and the intention for the use of the citalopram was not as a placebo but as an active agent to assist in the management of BPSD which is not comparable with the other studies. In Figure 3 it is shown that the use of risperidone was effective for the management of BPSD.

Figure 3 Meta-Analysis Risperidone vs. Placebo



The study by Brodaty et al. 2005<sup>[38]</sup> illustrates high overall effectiveness in the reduction of BPSD symptoms. Frank et al. 2004<sup>[39]</sup> illustrated a more modest improvement but a slight improvement all the same.

This favourable result in the use of risperidone is tempered in both studies through secondary information collected around side effects of risperidone and the impact that its use has on the residents' quality of life such as increased falls, somnolence, and medical complications such as cerebrovascular accident. This secondary information is important as it speaks to the appropriateness of the intervention. Both Brodaty et al. 2005<sup>[38]</sup> and Frank et al. 2004<sup>[39]</sup> discuss the use of risperidone is most effective in the subjects that had psychotic symptoms of BPSD.

The studies by Khan et al. 2011<sup>[51]</sup> and Crotty et al. 2004<sup>[28]</sup> both looked at the appropriateness effectiveness of the expert assistance in the management of BPSD. The study by Khan et al. 2011<sup>[51]</sup> only reported a percentage of staffs satisfaction and their perception of the effectiveness of the assistance. These percentages were not appropriate for Meta-Analysis.

#### 4.4.3 Common themes from qualitative and quantitative evidence

This comprehensive systematic review provides both quantitative and qualitative research evidence. There were common themes across both types of evidence. A common theme was that the staff that cared for the residents was receptive to education and assistance on how to care for residents exhibiting BPSD. This was shown in the studies by Kahn et al. 2011<sup>[51]</sup>, Crotty et al. 2004<sup>[28]</sup>, Ervin et al. 2012<sup>[26]</sup> and Zuidema et al. 2011<sup>[49]</sup> where all the staff who participated in the studies felt that they were not confident and felt unsupported to implement some strategies to manage BPSD both pharmacological and non-pharmacological. The provision of additional education and support would be seen as an appropriate and hopefully effective method of improving management of BPSD.

Cornege-Blockland et al. 2012<sup>[52]</sup> showed that there was no consistency in the use of pharmacological measures in the management of BPSD. This study speaks to the importance of expert assistance in the management of behaviours and the need for ongoing education around strategies to manage behaviours.

The qualitative studies by Gotell et al. 2007<sup>[35]</sup> and Gerdner 2005<sup>[36]</sup> had a focus on empowering staff to carry out the intervention through the provision of education and support. These studies like the Cohen Mansfield et al. <sup>[46, 48, 53]</sup> studies in this review focus on the effective use of stimuli and the appropriate application of these stimuli in ameliorating BPSD. These studies and the work on music found that familiarity was important in the implementation of a successful strategy. This is also seen in the Cohen Mansfield et al. 1998<sup>[44]</sup> study which looks at altering the environment to reduce incidence of pacing as a BPSD and it showed effective and appropriate management was achieved by improving the appeal and aesthetics of areas of the residential facility.

Luttenberger et al. 2012<sup>[43]</sup> looked at the use of a multi-faceted approach to non-pharmacological management of BPSD. The MAKS protocol focused on multiple domains and uses a variety of interventions and involved significant training to staff. This resulted in an overall improvement of BPSD and improved the residents functional levels making this both an effective and appropriate management strategy.

The studies that focused on Risperidone, Brodaty et al. 2005<sup>[38]</sup> and Frank et al. 2004<sup>[39]</sup> showed Risperidone to be effective in the management of BPSD but there were questions over the side effects of the drug such as increase risk of falls, increased somnolence and increased risk of cerebral vascular accident. These risks are significant which leads us to question the appropriateness of use unless in a situation which there is no other answer. Ruths et al. 2007<sup>[40]</sup> shows that it is feasible to cease antipsychotic medication and that the short term use of antipsychotic drugs are appropriate and fit with prescribing guidelines. It also showed that the short term usage of antipsychotics was effective through the reduction in BPSD symptoms after ceasing the medication and the low rates of recommencing on the antipsychotic medication after trial of cessation.

Pollock et al. 2007<sup>[37]</sup> looks at the use of citalopram and risperidone showing effective management with both substances in the management of BPSD symptoms. Citalopram showed to have fewer side effects but there were still a significant number of side effects that needed to be considered in the use of citalopram. Propranolol is looked at by Peskind et al. 2005<sup>[42]</sup> and it is shown to be effective in a narrow range of behaviours and residents which would suggest it is not appropriate to use propranolol in residential aged care.

Ballard et al. 2002<sup>[41]</sup> demonstrated that through the use of Melissa oil there could be some benefits in managing BPSD. Agitation was the area that it showed the best effect. This was a well-tolerated intervention making it appropriate in the context of residential aged care.

# Chapter 5 Discussion

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This Chapter provides the discussion on the six key management strategies areas identified in the protocol of the systematic review. These areas were identified using both qualitative and quantitative evidence. This chapter also looks at the issues with research methodology that were found in conducting this systematic review and discusses the limitations of this study.

## 5.1 Standard behavioural therapies

These therapies included live social situations such as interacting with: a real baby, a real dog or another person (one to one socializing). Tasks based therapies such as: flower arrangement, coloring with marker pens, reading books. Self-identity therapies where individual stimuli are designed to match the residents past identity based on lived experience. Simulated social therapies involve engaging with objects which are life like, and give the person the feeling that they are interacting with the real object person or animal. All of the aforementioned interventions were referenced across the three include studies. All of these therapies were able to engage the residents for varying lengths of time. So as a group of activities or strategies to assist in managing BPSD they are useful.

Luttenberger et al. 2012<sup>[43]</sup> investigated the use of a variety of standard therapies and this study was part of a systematic implementation of therapies and occupation based activities to assist in the management of BPSD. The key to the MAKS intervention described by Luttenberger et al. 2012<sup>[43]</sup> was that it focused not only on a single intervention but groups of activity with the overall aim of improving functional ability and cognition. This study did not evaluate the overall effectiveness of a single behavioral therapy but as a combination of therapies. This was overwhelmingly positive study and a large scale study giving even more credibility to the use of multiple tools to achieve an overall improvement in the management of a person's behavior.

Cohen-Mansfield et al. 2011<sup>[53]</sup> examined the barriers to the provision of non-pharmacological interventions for residents. This study highlighted that the standard behavioral interventions such as interacting in a one to one capacity with the resident had the least barriers to implementation hence they were effective in managing behaviours. Cohen-Mansfield et al. 2009<sup>[48]</sup> also look at the impact of standard stimuli and found that the stimuli that tapped into the subjects work experience was the best at engaging the resident. This activity form of reminiscence used the past experience of work and occupation to stimulate the subject therefore using a target intervention to channel the resident's attention and manage behaviours. Cohen-Mansfield et al. explored this further in the 2010<sup>[46]</sup> study

which examined the social appropriateness of an intervention and the value of personalized stimuli based on the persons self-identity as it relates to agitated residents. This study found that the one to one stimulation or the simulated social setting has the most profound effect in managing agitation in highly agitated residents. This was also shown to be an intervention which had the least barriers to implementation and was the intervention employed most frequently in Cohen-Mansfield et al. 2011[53].

Khan et al. 2011<sup>[51]</sup> addressed the value of the use of expert opinion in managing residents with behaviours. Khan et al. 2011<sup>[51]</sup> identified that lack of knowledge in how to implement non-pharmacological interventions such as reality therapy, relaxation, reminiscence therapy, person centered approach, doll therapy and other therapies lead to an inability to consistently follow through a management plan and staff did not have the confidence to use these techniques as determined in a self-reported survey.

The use of standard behavioral therapies is seen to be effective and appropriate to be used to assist in managing BPSD. Importantly these interventions need to be targeted at the resident using their life experiences and their reality basis as a reference point in implementing techniques <sup>[44, 48, 53]</sup>. The care staff who are implementing these techniques need to feel confident when using the techniques and the behavioral therapy need to be implemented consistently by staff all staff to be effective.

In all of the studies reviewed, the crucial factor in the implementation of such interventions appears to be that the staff are confident and practiced in the use of the interventions and they have support from management to implement them. Each study had a preparatory phase where education was provided to the staff implementing the intervention. This education process created an environment which was conducive to the use of these interventions. The success of such interventions is dependent on all care and lifestyle staff being engaged in the purpose of the activity. In these studies the purpose of these activities was to reduce the prevalence and severity of behaviours. These studies did not look at the wellbeing or the quality of life of the residents and this would have assisted in giving value to the interventions. The implementation of activities to manage residents BPSD is just as important and valid as any other action that is taken to manage a client in the care environment. With this in mind more time and resources need to focus on making these activities part of the residential care culture. In my clinical experience creating such a culture would have many benefits to staff and residents with the ultimate result a quality outcome for the care of the residents.

## **5.2 Alternative therapies**

Music therapy was looked at by Gotell et al. 2007<sup>[35]</sup> and Gerdner 2005<sup>[36]</sup>. Both of these studies focused on music as an emotive force to manage behaviours. Gotell et al. 2007<sup>[35]</sup> focused on care

giver singing especially when attending to hygiene in the morning. This study positively linked the experience of music and particularly singing traditional songs of childhood with being able to manage a resident's behaviour more successfully. This was not limited to singing but the carer could hum the familiar tune with similar results. This was again a clear and positive link between targeted interventions based on the subjects lived experience. Gerdner 2005<sup>[36]</sup> looked at the roll of the music therapist and the importance of training staff in this area. Through assessing the musical preference of the resident it was possible to put together a list of songs which elicit positive feelings and reduce agitation this is thought to be done through stimulating remote memory.

The use of alternative therapies is an area that needs to be considered further by clinicians. As was highlighted by Gerdner 2005<sup>[36]</sup> trained staff who understand the use of the intervention is vital to it being successful. Music is a simple and targeted intervention which can aid in the management of behaviours if focused at the residents' lived experience and has no detrimental side effects for the person with dementia or the carer.

### **5.3 Complementary therapies**

Aromatherapy was explored by Ballard et al. 2002<sup>[41]</sup> this trial looked at the impact of Melissa oil. Ballard et al. 2002<sup>[41]</sup> evidenced the clinical effectiveness in reducing agitation in clients with severe dementia. This finding also went on to describe an overall improvement in quality of life for the subjects and that this intervention was not only safe, but effective and rewarding for the staff who were implementing it. The increased social and physical contact that is inherent with this intervention is also a factor which should be considered when employing aromatherapy. There were no other studies that were identified in this systematic review which discuss the use of complementary therapies as a management tool. There was numerous articles excluded which referenced complementary therapies as a part of holistic management of client not as a primary management technique.

Aromatherapy is a commonly employed intervention in aged care. The usual use of aromatherapy uses aromatherapy to eliminate other odors in the care environment. Quite often it is through the use of a diffuser or oil burner and implemented as part of a sensory activity for example naming the scent and as a catalyst for reminiscence. This use is not designed to manage behaviours but as part of a lifestyle program. Many papers were excluded as the aim of the intervention was not explicitly to manage behaviours or they were a discussion on the observations of using aromatherapy. What was noted was the aromatherapy interventions were often administered broadly to groups or as a blanket and the interventions were not administered by staff trained in the use of aromatherapy neither were there

appropriate procedures or guidelines in place for the management of these activities. As with all interventions they need to be targeted and assessed as to the benefit of the intervention for the recipient. It is also crucial that the intervention is implemented by appropriately trained and skilled staff to maximize effect.

## **5.4 Psychotherapies**

Ervin et al. 2012<sup>[26]</sup> identified that psychotherapies were not employed by staff and were perceived as less effective in the management of BPSD and that the major impediment to their implementation was lack of time by staff. Khan et al. 2011<sup>[51]</sup> also mentions behavioral therapies as a tool that is taught to staff of residential care facilities with the support of community mental health teams. Crotty et al. 2004<sup>[28]</sup> has a base line of education provided by Alzheimer's Australia for the staff that participated in this study. The behavioral tool kit that was taught by Alzheimer's Australia covers the use of psychotherapies. All three of these studies make the point that the multi-disciplinary team consisting of experts is best at assessing and developing interventions for managing behaviours. Psychotherapies has been identified as one of the tools that they employed, but this study did not directly suggest that any psychotherapy was successful in managing BPSD alone and it is referred to as an adjunct therapy.

The use of Cognitive behavioural therapy (CBT) was the most commonly discussed therapy in the literature searched. Most of the studies were carried out in the community and with residents who had mild cognitive impairment. These studies although not included in this thesis as they were not based in the residential care environment. The main aspect of CBT being an effective treatment is the need for the person receiving the CBT to be mindful of their behaviours and practice the skills that they learn. CBT was shown to be effective in people with anxiety and early cognitive impairment. But for the cohort of residents in aged care often the degree of impairment is too significant for this to be of any great benefit. Of course residents in care may be at different stages of their illnesses, in these examples where a resident may be in care for physical issues and have an emerging dementia and BPSD issues then CBT could be considered. As with every intervention that is used to manage BPSD it needs to be targeted and appropriate to the resident and their abilities and experience.

## **5.5 Environmental conditions**

That the environment that a resident is in influences the management of the resident this is shown in the study by Zuidema et al. 2011<sup>[49]</sup>. The amount of residents to living rooms and bed rooms increase the probability of BPSD being a problem and this was reflected in the prescription of anti-psychotic medication. This ratio also had an influence on the level of staff distress in the provision of care to the



subjects. The study by Zuidema et al. 2011<sup>[49]</sup> also references the use of a walking circuit which is a circular passage which enable residents to wander without finding closed doors. The presence of a walking circuit reduced the base line agitation for residents. Cohen Mansfield et al. 1998<sup>[44]</sup> shows the impact of using an enhanced environment in reducing agitated behaviours. In the study by Cohen Mansfield et al. 1998<sup>[44]</sup> the altering of a clinical looking corridor and giving it a nature theme or a home like theme was an inexpensive and effective way of improving management for people who wandered and it also helped with the overall wellbeing of the staff and the visitors to the area.

The creation of specifically designed environments for the care of people with dementia would be the optimal intervention for providing safety in the care of residents who wander. There was little mentioned on the impact of environment on other BPSD traits. The use of walking trails was well documented in literature and seemingly a common practice in European facilities. Zuidema et al. 2011<sup>[49]</sup> provides good evidence that this is a valuable intervention. Some of the papers identified focused on the design of psycho geriatric units or special care units which was outside of the context of this study. It would be reasonable to apply these principles to all residential aged care facilities. What was not discussed in these studies was the use of colour and light. There were studies which looked at health care environments but focused on environmental safety such as slip trips and falls. The impact of light and colour were discussed but not in the context of the residential aged care setting and related directly to the management of BPSD.

## **5.6 Pharmacological management**

The majority of papers found for this systematic review had a focus on the use of pharmaceutical agents to manage BPSD. There were three types of papers, the randomized control trial which looked at the effectiveness of one drug against another or against a placebo. There were longitudinal cohort studies which focused on the prescribing habits of medical officers and looked at the use of anti-psychotic medication. The third type of paper analyzed the appropriate use of medication using the assistance of expert opinions of clinical pharmacists, psycho-geriatricians and expert mental health teams.

## **5.7 Effectiveness of agents**

The effectiveness of Risperidone was looked at in the study by Brodaty et al. 2005<sup>[38]</sup> in a double blind placebo controlled study. This study showed that Risperidone was highly effective in the management of psychosis and aggressive behavior. This study also found that despite the effectiveness of Risperidone there were considerable risks in using this medication with 22 of 42 subjects experiencing adverse effects. Pollock et al. 2007<sup>[37]</sup> looked at the use of Risperidone as compared with the use of

citalopram. This study proved both to be effective in the management of psychosis and in reducing overall agitation. In this study Citalopram proved to have a less sedating effect than Risperidone and have fewer extra-pyramidal effects. Frank et al. 2004<sup>[39]</sup> looked at the use of Risperidone as it related to the burden of caring for patients. This placebo controlled study suggested that the use of Risperidone improved the ease of caring for clients with BPSD which was both an actual and a perceived burden. This led to the conclusion that any improvement in the attitude of staff when caring for people with BPSD reflected positively in the care provided. This study did not take into account the effects of the medication on the subject or look at the actual effect of the medication. The final study that was looked at in this area was by Peskind et al. 2005<sup>[42]</sup> in which Propranolol was looked at for the management of BPSD. Propranolol proved effective in reducing agitation anxiety and aggression. This was a small scale study but gave good indication that Propranolol could be considered for BPSD especially in the domains of agitation, anxiety and aggression. Ruths et al. 2004 takes a reverse look at the use of agents to manage behaviours, in this study the focus is on anti-psychotic withdrawal of BPSD. This paper discusses the value of the trial of ceasing long term anti-psychotics based on the premise that anti-psychotics are best used over a short period of time and for a specific purpose. This paper evidenced the effectiveness of taking subjects off anti-psychotic medication periodically and makes a compelling case for the short term use of anti-psychotics and the close monitoring of medication usage in aged care facilities.

## **5.8 Longitudinal studies**

The longitudinal studies looked at patterns of behaviours and treatment methods. Ramadan et al. 2003<sup>[47]</sup> focuses on the correlation between the behaviours exhibited by subjects and the treatments used to manage these behaviours. It was clear in this study that there was no direct correlation between the type of medication prescribed and the behaviours that were exhibited by the subjects. This indicates that there is no standard way that the medications are used for the management of BPSD. This opinion is supported Cornege-Blockland et al. 2012<sup>[52]</sup> who looked at the reasons why antipsychotic medication was prescribed in Dutch nursing homes. This study showed that there was no consistency in the use of medications and it was based on the individual preferences of physicians or facilities. This study also looked at the impact and perceived impact that the use of this class of medication has on residents. There was a large underestimation of the side effects and the adverse effects that need to be considered when prescribing anti-psychotic medication.

These longitudinal studies contribute greatly to the understanding of the management of BPSD. The perception of effect is a significant factor in deciding how to manage behaviour. If we believe that something is going to work it seems to. This self fulfilling prophecy is quite true in the management of clients in aged care. Non pharmacological agents are not seen as effective as medication and in these studies the physicians, nurses all saw a benefit to the use of medication but there was little evidence in the on-going reduction in the prevalence of behaviours. These studies prove that evidence of effect will be seen if that is what we are looking for. As it was aptly said in the study by Cornege-Blockland et al. 2012<sup>[52]</sup> "anything that reduces the burden of care for staff is considered a good thing." This basic premise ensures that the monitoring of medication usage in the aged care environment needs to be questioned. It also suggests that there is a need to constantly encourage adherence to best practice in relation to the prescribing of medication.

## **5.9 Medication optimization and expert opinion**

These studies were the most convincing in their approach and evidence. The study by Crotty et al. 2004<sup>[28]</sup> looks at the use of multi-disciplinary teams and case conferencing as does Khan et al. 2011<sup>[51]</sup>. Both of these studies show that medications are optimized with a clinical pharmacist recommending the cessation and commencement of several medications. This study also highlighted that the knowledge that staff in a facility feel they have is different to what they have the confidence to practice<sup>[51]</sup>. Ervin et al. 2012 also looked at the knowledge of staff in relation to the use of medications. In this study they found that confidence was based on the previous use of the medication in the facility and the strategies employed at each facility differed as was an availability to access expert assistance in managing clients. Staff were aware of this resource but there was a reluctance to use such a service.

The Crotty et al. 2004 study also showed through the improved use of medications there could be a financial benefit to the organization which demonstrated cost effective management. Although this is a secondary finding it was a consistent theme in a lot of the literature. There were papers excluded which explored the prescribing habits of medical staff and the cost of these treatments. These papers did not comment on the effective management of clients and this is the reason they were not included.

In the use of expert opinion we are able to see an empowering of the staff with knowledge. But all of the studies reported that the knowledge was already there. This takes us to the issue of confidence in practice. Whilst we may know something about managing people with BPSD we may not be confident to put this knowledge into practice. Crotty et al. 2004 reports that the information that was gained about the client for whom the case conference was held was applied to that client. The information was not

applied to the others in the unit which may be exhibiting similar behaviours. The information discussed was transferable to other situations, but was not. It could be concluded that this was due to lack of confidence of staff to manage BPSD as shown by Khan et al. 2011 and Ervin et al. 2012.

### **5.10 Methodological issues in research**

Identifying appropriate qualitative research was difficult for this study as there were no studies located that identified the philosophical perspective that the research was conducted under. The two papers included in this review identified themselves as qualitative studies. Both of these studies failed to describe the philosophical standpoint that the research was conducted from. This was consistent in the literature that was searched for this systematic review and thesis.

Caelli et al 2003 describes this, "lack of allegiance to philosophical to an established qualitative method", as generic qualitative research. By failing to declare the basis of the enquiry it diminishes the rigour of the study. The rigour of the study and the adherence to good scientific research practices is a measure of external validity for the research be it qualitative or quantitative. This review would have been richer for the disclosure of methods. Through understanding that the research is based on the lived experience and then understanding that the researcher either interpreted the actions, events and the text or if they merely reported the observed phenomena changes the perception of what the results show us. In the studies that were used in this systematic review there was no effort made to interpret the words or actions. These studies could be then seen a phenomenological but without this being stated and then not stating the school of phenomenology used it would only be my interpretation of the events without context or reference.

Therefore in research that is conducted in the area of BPSD there needs to be a consistent effort to communicate to the readers the basis of enquiry. As this is a factor that would influence the perception and then the interpretation of the data and the findings presented. For this study I am content to draw conclusions from the illustrations in the papers and the researcher's discussion. I feel that I have not used or interpreted the results provided.

### **5.11 Limitations of this study.**

This systematic review and thesis aimed to assemble the best evidence in the management of BPSD in residential care. Every effort was made to find all relevant papers but despite there may be some studies that have not been identified. This study in its search design only considered papers that were published in English and this could have resulted in some studies not being identified. This study was

conducted to satisfy the criteria of a master's degree and in that there were some time restriction on the process of finding and utilizing the evidence.

It was clear throughout this process that the methodological issues of the research that was being looked at would preclude or make difficult to identify studies that were either of the qualitative or quantitative school of research. Although there were no papers directly excluded for their methodological quality I feel that some of the studies excluded because they were considered a narrative or text and opinion paper could have been a primary study, poorly reported. Also by limiting this study to qualitative and quantitative studies reduced the amount of literature that was searched hence limiting the study.

Identifying which study was conducted in a residential care facility according to the set definition of a residential facility was also difficult. Throughout the world residential care has many different names, as many of these were included in the search terms as possible. But owing to the vast differences in standards of aged care throughout the world there would have been some studies not captured. Excluding psycho geriatric hospital facilities also resulted in studies being excluded which was a potential limitation but also a necessary exclusion in ensuring the studies were correctly targeted.

# Chapter 6 Conclusions and Recommendations

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This chapter aims to provide conclusions from the results, findings and synthesis presented in this thesis. It will also give recommendations drawn from evidence to guide practice and research

## 6.1 Conclusions

From this study the main conclusion that can be drawn is that, effectiveness in management of BPSD is dependent on correct diagnosis of the behavior and the detection of underlying pathology, organic or psychiatric. When an informed and accurate diagnosis is made, based on good quality assessment then the interventions which are employed to manage these behaviours can be targeted, focused on what fits the residents needs the best. These targeted interventions need to be consistently used and based on the residents experiences and pathology. The staff working with the residents need to feel confident in applying the interventions and supported by the organization to take the time to apply the interventions. Through following this process BPSD will be better addressed, and staff will feel more satisfied with the work that they are doing. The residents will benefit from a personalized approach to their care with the aim of better outcomes for all.

Implications for practice and research are based on the levels of evidence developed by the Joanna Briggs Institute<sup>[2]</sup>. The levels of evidence were developed to assess the validity of recommendations made by those appraising current knowledge and gaps in knowledge identified in systematic reviews<sup>[2]</sup>. (See Appendix VIII for the JBI of levels of evidence)

## 6.2 Recommendations for Practice

For clients with dementia who are exhibiting BPSD in residential care the recommendations for practice included in this study are as follows.

### *Interventions need to be targeted (Level 1)*

Interventions used for the management of BPSD need to be based on the residents' experiences. An intervention such as music and work based stimuli needs to fit with the resident's experiences if they are to be effective. There needs to be an understanding and assessment of the residents past experiences if this is to be an effective process.

### *Behaviours need to be appropriately and expertly assessed (Level 2)*

The impact of expert opinion and assistance in managing BPSD is invaluable and should be considered as a first line management priority if there is a problem behavior that cannot be managed with the available resources of a facility or is outside the facilities management experience.

### *Pharmacology is not an answer in isolation (Level 3)*

The use of medications such as anti-psychotics and atypical anti-psychotics can be effective, but they need to be monitored closely used on residents with correctly diagnosed psychotic symptoms and have non-pharmacological treatments to complement the medication used. There also needs to be a commitment to trial cessation of the antipsychotic medication and use the medications when all other avenues of treatment have been explored

### *Interventions need to be simple (Level 4)*

To ensure compliance with all levels of staff implementing an intervention intended to manage BPSD and residents participating in an activity the intervention needs simple. The intervention also needs to require little effort to set up for staff with an aim of quickly engaging the residents. The intervention then needs to be constantly assessed to ensure that it effective and beneficial to residents.

### 6.3 Recommendations for further research

From this study it is considered that further research should be focused on

#### *Effectiveness of expert management teams (Level 2)*

Increase study into effectiveness of expert management teams within residential care facilities to manage behaviours with the aim of increasing access to these services and looking at the barriers to the use of such services.

#### *Quality use of medications (Level 2)*

There is a need to assess the impact of long term antipsychotic medication usage in residential care facilities on the residents. These studies need not only look at the effectiveness of agents in reducing incidence and severity of behaviours, but what the quality of life is then like for the residents.

#### *Standard effectiveness measures for BPSD (Level 3)*

Increasing and developing standards to measure effectiveness consistently in monitoring behaviours in residential care so to be able to compare interventions reliably. Through the use of standardized psychometric tools to study BPSD it would create more opportunity for meta-analysis of studies.

#### *Holistic management model for behaviours (Level 3)*

Studies need to look at the use of a holistic management of behaviours. This would look at using a combination of management strategies form a model of care for clients; the aim would be to develop practice guidelines based on a trial model of care.



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36. Gerdner, L.A., *Use of individualized music by trained staff and family: translating research into practice.* Journal of Gerontological Nursing, 2005. **31**(6): p. 22.
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38. Brodaty, H., et al., *Risperidone for psychosis of Alzheimer's disease and mixed dementia: Results of a double-blind, placebo-controlled trial.* International Journal of Geriatric Psychiatry, 2005. **20**(12): p. 1153-1157.
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51. Khan, F. and M. Curtice, *Non-pharmacological management of behavioural symptoms of dementia*. British Journal of Community Nursing, 2011. **16**(9): p. 441-449.
52. Cornegé-Blokland, E., et al., *Reasons to Prescribe Antipsychotics for the Behavioral Symptoms of Dementia: A Survey in Dutch Nursing Homes Among Physicians, Nurses, and Family Caregivers*. Journal of the American Medical Directors Association, 2012. **13**(1): p. 80.e1-6.
53. Cohen-Mansfield, J., et al., *What Are the Barriers to Performing Nonpharmacological Interventions for Behavioral Symptoms in the Nursing Home?* J Am Med Dir Assoc, 2011.

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# Appendices

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## Appendix I: Logic grid of initial search terms

| Residential Care                  | Aged | BPSD   | Management strategies            |                                  | Participants              |
|-----------------------------------|------|--|----------------------------------|----------------------------------|---------------------------|
| Elderly care                      |      | Dementia   | Pharmacological/<br>Therapeutics | Non Pharmacological              | Male                      |
| Residential care                  |      | Alzheimer's  | Anti-Psychotics                  | Environmental management         | Female                    |
| Skilled nursing facility          |      | Behavioural<br>Psychological<br>symptoms of Dementia | Atypical Anti-<br>Psychotics     | Alternative therapies            | Human only                |
| Aged homes                        |      | Dementia multi infarct                               | Benzodiazepines                  | Music therapy                    | Aged                      |
| Aged care                         |      | Dementia Vascular                                    | Mood Stabilising<br>medication   | Reminiscence therapy             | Aged 65 years<br>and over |
| Homes for the aged                |      | Dementia frontal lobe                                | Anti-depressants                 | Aromatherapy                     |                           |
| Not Psycho geriatric<br>inpatient |      | Behaviour  | Anticonvulsants                  | Cognitive Behavioural<br>Therapy |                           |
| Geriatric care                    |      | Wandering  |                                  | Interpersonal Therapy            |                           |
| Nursing home                      |      | Agitation  |                                  | Bright light therapy             |                           |
| Extended care facility            |      | Aggression,  |                                  | Reality orientation              |                           |
|                                   |      | Spitting   |                                  |                                  |                           |
|                                   |      | Sensory deprivation                                  |                                  |                                  |                           |
|                                   |      | Sexuality  |                                  |                                  |                           |
|                                   |      | Hitting  |                                  |                                  |                           |
|                                   |      | Sexual dis-inhibition                                |                                  |                                  |                           |
|                                   |      | Culturally inappropriate<br>behaviour                |                                  |                                  |                           |
|                                   |      | Psychosis  |                                  |                                  |                           |
|                                   |      | Depression   |                                  |                                  |                           |

## Appendix II: Example Search Strings

PubMed search Conducted January 30<sup>th</sup> 2012

Search (((#1) AND #2) AND #3) AND #4) AND #5

#5 Add Search (((("male") OR "female") OR "human") OR ("aged/65" OR "aged/65years" OR "aged/69" OR "aged/70" OR "aged/75" OR "aged/90" OR "aged/95" OR "aged/adult")) OR "geriatric"

#4 Add Search (((((((("non pharmacological") OR "environmental conditions") OR "alternative therapies") OR "music therapy") OR "reminiscence therapy") OR "aromatherapy") OR "cognitive behavioural therapy") OR "interpersonal therapy") OR "bright light therapy") OR "reality orientation"

#3 Add Search (((((((("pharmacological") OR "therapeutics") OR "anti-psychotics") OR "atypical anti psychotics") OR "benzodiazepines") OR ("mood stabilising medication" OR "mood stabilizer anticonvulsants" OR "mood stabilizer drug")) OR "anticonvulsants") OR "antidepressants" 275767

#2 Add Search (((((((((((((((("bpsd") OR "dementia") OR "alzheimers") OR "dementia multi infarct") OR "dementia vascular") OR "dementia frontotemporal") OR "behaviour") OR "wandering") OR "agitation") OR "aggression") OR "spitting") OR "sensory deprivation") OR "sexuality") OR ("hitting" OR "hitting/kicking" OR "hitting/kicking/pushing")) OR "sexual disinhibition") OR "culturally inappropriate") OR "psychosis") OR "depression"

#1 Add Search (((((((((((("residential aged care") OR "elderly care") OR residential care) OR skilled nursing facility) OR "aged care") OR "aged home") OR "homes for the aged") OR "geriatric care") OR "nursing home") OR "extended care facility") NOT "psychogeriatric"

### Appendix III: Studies not selected for retrieval

1. High drug use for dementia. Australian Nursing Journal.2010; 17( 11): 6-6. **Not primary research**
2. . Monitoring psychotropic drugs' utilization and cost in psychiatric services and general practice. Giornale Italiano di Farmacia Clinica.2003; 17( 1): 33-47. **Not aged care related**
3. Akanuma, K., Meguro, K., Meguro, M., Sasaki, E., Chiba, K., Ishii, H., Tanaka, N.. Improved social interaction and increased anterior cingulate metabolism after group reminiscence with reality orientation approach for vascular dementia. Psychiatry Research - Neuroimaging.2011; 192( 3): 183-187. **Not related to managing BPSD**
4. Alderman, C.. A drug-free zone... one home which is drug free. Nursing Standard.1998; 12( 47): 21-23. **Text and opinion**
5. Atwell, J.. How senior nurses can lead the way in dementia services. Nursing & Residential Care.2010; 12( 8): 394-395.**Text and opinion**
6. Austrom, M. G., Hartwell, C., Moore, P., Perkins, A. J., Damush, T., Unverzagt, F. W., Boustani, M., Hendrie, H. C., Callahan, C. M.. An integrated model of comprehensive care for people with Alzheimer's disease and their caregivers in a primary care setting. Dementia (14713012).2006; 5( 3): 339-352. **Not related to Residential care**
7. Barton, S., Findlay, D., Blake, R. A.. The management of inappropriate vocalisation in dementia: A hierarchical approach. International Journal of Geriatric Psychiatry.2005; 20( 12): 1180-1186. **Text and opinion**
8. Beck, C. K.. Psychosocial and behavioral interventions for Alzheimer's disease patients and their families. American Journal of Geriatric Psychiatry.1998; 6( 2 SUPPL.): S41-S48. **Text and opinion**
9. Beck, C. K. and Shue, V. M.. Interventions for treating disruptive behavior in demented elderly people. Nursing Clinics of North America.1994; 29( 1): 143-155. **Text and opinion**
10. Benoit, M., Brocker, P., Clement, J. P., Cnockaert, X., Hinault, P., Nourashemi, F., Pancrazi, M. P., Portet, F., Robert, P., Thomas, P., Verny, M.. Behavioral and psychological symptoms in dementia: Description and management. Pratique neurologique les symptômes psychologiques et comportementaux de la démence: Description et prise en charge.2005; 161( 3): 357-366. **Not in English**
11. Bharani, N. and Snowden, M.. Evidence-based interventions for nursing home residents with dementia-related behavioral symptoms. Psychiatric Clinics of North America.2005; 28( 4): 985-1005. **Text and opinion**
12. Bianchetti, A., Ranieri, P., Margiotta, A., Trabucchi, M.. Pharmacological treatment of Alzheimer's disease. Aging - Clinical and Experimental Research.2006; 18( 2): 158-162. **Prospective study**
13. Billig, N., Cohen-Mansfield, J., Lipson, S.. Pharmacological treatment of agitation in a nursing home. J Am Geriatr Soc.1991; 39( 10): 1002-5. **Text and opinion**
14. Bonner, L. T. and Peskind, E. R.. Pharmacologic treatments of dementia. Medical Clinics of North America.2002; 86( 3): 657-674. **Text and opinion**

15. Borson, S., Scanlan, J. M., Doane, K., Gray, S.. Antidepressant prescribing in nursing homes: Is there a place for tricyclics?. *International Journal of Geriatric Psychiatry*.2002; 17( 12): 1140-1145. **Text and opinion**
16. Bowles, E. J., Cheras, P., Stevens, J., Myers, S.. A survey of aromatherapy practices in aged care facilities in northern NSW, Australia. *International Journal of Aromatherapy*.2005; 15( 1): 42-50. **Not primary research**
17. Bowman, Clive. A pragmatic approach to prescribing in care homes. *GM: Midlife & Beyond*.2011; 41( 9): 444-446. **Text and opinion**
18. Boyce, R. D., Hanlon, J. T., Karp, J. F., Kloke, J., Saleh, A., Handler, S. M.. A Review of the Effectiveness of Antidepressant Medications for Depressed Nursing Home Residents. *Journal of the American Medical Directors Association*.2011; ( ): .**Review article**
19. Brodaty, H. and Cumming, A.. Dementia services in Australia. *International Journal of Geriatric Psychiatry*.2010; 25( 9): 887-995. **Overview of services**
20. Buffum, M. D., Hutt, E., Chang, V. T., Craine, M. H., Snow, A. L.. Cognitive impairment and pain management: review of issues and challenges. *Journal of Rehabilitation Research & Development*.2007; 44( 2): 315-329. **Text and opinion**
21. Carr, Tracy J., Hicks-Moore, Sandee, Montgomery, Phyllis. What's so big about the little things?: A phenomenological inquiry into the meaning of spiritual care in dementia. *Dementia*. 2011; 10( 3): 399-414. **Not related to BPSD management**
22. Caselli, R. J. and Yaari, R.. Medical management of frontotemporal dementia. *American Journal of Alzheimer's Disease and other Dementias*.2008; 22( 6): 489-498. **Text and opinion**
23. Charras, K., Zeisel, J., Belmin, J., Drunat, O., Sebbagh, M., Gridel, G., Bahun, F.. Effect of personalization of private spaces in special care units on institutionalized elderly with dementia of the Alzheimer type. *Non-pharmacological Therapies in Dementia*.2010; 1( 2): 121-138. **Text and opinion**
24. Christensen, M. D. and White, H. K.. Dementia Assessment and Management. *Journal of the American Medical Directors Association*.2007; 8( 3 SUPPL. 2): e89-e98. **Text and opinion**
25. Cipriani, G., Vedovello, M., Nuti, A., Di Fiorino, M.. Aggressive behavior in patients with dementia: Correlates and management. *Geriatrics and Gerontology International*.2011; 11( 4): 408-413. **Related to only aggression and in multiple contexts**
26. Clément, J. P.. Depression in the elderly; future prospects. *Dépression du sujet âgé: perspectives*..2004; 2 Suppl 1( ): S69-72. **Not in English**
27. Cohen-Mansfield, J.. Conceptualization of agitation: results based on the Cohen-Mansfield Agitation Inventory and the Agitation Behavior Mapping Instrument. *Int Psychogeriatr*.1996; 8 Suppl 3( ): 309-15; discussion 351-4. **Not related directly to the management of patients**
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29. Cohen-Mansfield, J. and Jensen, B.. Physicians' perceptions of their role in treating dementia-related behavior problems in the nursing home: actual practice and the ideal. *J Am Med Dir*



Assoc.2008; 9( 8): 552-7. **Descriptive analysis**

30. Cohen-Mansfield, J. and Jensen, B.. Nursing home physicians' knowledge of and attitudes toward nonpharmacological interventions for treatment of behavioral disturbances associated with dementia. J Am Med Dir Assoc.2008; 9( 7): 491-8. **Descriptive analysis**
31. Cohen-Mansfield, J. and Jensen, B.. Assessment and Treatment Approaches for Behavioral Disturbances Associated With Dementia in the Nursing Home: Self-Reports of Physicians' Practices. Journal of the American Medical Directors Association.2008; 9( 6): 406-413. **Review Article**
32. Cohen-Mansfield, J. and Libin, A.. Assessment of agitation in elderly patients with dementia: correlations between informant rating and direct observation. Int J Geriatr Psychiatry.2004; 19( 9): 881-91. **Assessment tool not BPSD management**
33. Cohen-Mansfield, J. and Mintzer, J. E.. Time for change: the role of nonpharmacological interventions in treating behavior problems in nursing home residents with dementia. Alzheimer Dis Assoc Disord.2005; 19( 1): 37-40. **Text and opinion**
34. Cohen-Mansfield, J., Dakheel-Ali, M., Jensen, B., Marx, M. S., Thein, K.. An analysis of the relationships among engagement, agitated behavior, and affect in nursing home residents with dementia. Int Psychogeriatr.2012; 24( 5): 742-52. **Discussion paper**
35. Cohen-Mansfield, J., Lipson, S., Horton, D.. Medical decision-making in the nursing home: a comparison of physician and nurse perspectives. J Gerontol Nurs.2006; 32( 12): 14-21. **Not focused on BPSD**
36. Cohen-Mansfield, J., Marx, M. S., Rosenthal, A. S.. Dementia and agitation in nursing home residents: how are they related?. Psychol Aging.1990; 5( 1): 3-8. **Text and opinion**
37. Cohen-Mansfield, J., Thein, K., Dakheel-Ali, M., Marx, M. S.. Agitation in elderly persons: an integrative report of findings in a nursing home. Int Psychogeriatr.1992; 4 Suppl 2( ): 221-40. **Review paper**
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39. Cohen-Mansfield, J., Thein, K., Marx, M. S., Dakheel-Ali, M., Murad, H., Freedman, L. S.. The relationships of environment and personal characteristics to agitated behaviors in nursing home residents with dementia. J Clin Psychiatry.2012; 73( 3): 392-9. **Does not describe management**
40. Cohen-Mansfield, J., Werner, P., Marx, M. S., Freedman, L.. Two studies of pacing in the nursing home. J Gerontol.1991; 46( 3): M77-83. **Case study**
41. Corey-Bloom, J., Yaari, R., Weisman, D.. Managing patients with Alzheimer's disease. Practical Neurology.2006; 6( 2): 78-89. **Text and opinion**
42. Denney, A.. Quiet music: an intervention for mealtime agitation?. Journal of Gerontological Nursing.1997; 23( 7): 16-23.
43. Dewing, J.. Responding to agitation in people with dementia. Nursing Older People.2010; 22( 6): 18-25. **Text and opinion**

44. Duara, R., Barker, W., Loewenstein, D., Bain, L.. The basis for disease-modifying treatments for Alzheimer's disease: The Sixth Annual Mild Cognitive Impairment Symposium. *Alzheimer's and Dementia*.2009; 5( 1): 66-74. **Not residential care**
45. Edell, W. S. and Tunis, S. L.. Antipsychotic treatment of behavioral and psychological symptoms of dementia in geropsychiatric inpatients. *American Journal of Geriatric Psychiatry*.2001; 9( 3): 289-297. **Psychogeriatric**
46. Ellingrod, V. L., Schultz, S. K., Ekstam-Smith, K., Kutscher, E., Turvey, C., Arndt, S.. Comparison of risperidone with olanzapine in elderly patients with dementia and psychosis. *Pharmacotherapy*.2002; 22( 1 I): 1-5. **Not residential specific**
47. Fetveit, A., Skjerve, A., Bjorvatn, B.. Bright light treatment improves sleep in institutionalised elderly - An open trial. *International Journal of Geriatric Psychiatry*.2003; 18( 6): 520-526. **Focus on sleep**
48. Finkel, S. I.. Managing the behavioral and psychological signs and symptoms of dementia. *International Clinical Psychopharmacology*.1997; 12( SUPPL. 4): S25-S28. **Does not describe management**
49. Fiske, A., Wetherell, J. L., Gatz, M.. Depression in older adults. .2009; 5( ): 363-389. **Focus on depressive symptoms**
50. Foley, K. L., Sudha, S., Sloane, P. D., Gold, D. T.. Staff perceptions of successful management of severe behavioral problems in dementia special care units. *Dementia (14713012)*.2003; 2( 1): 105-124. **Unable to retrieve**
51. Forester, B., Vanelli, M., Hyde, J., Perez, R., Ahokossi, C., Sribney, W., Adkison, L.. Report on an open-label prospective study of divalproex sodium for the behavioral and psychological symptoms of dementia as monotherapy and in combination with second-generation antipsychotic medication. *American Journal Geriatric Pharmacotherapy*.2007; 5( 3): 209-217. **Pharmacological study**
52. Fujii, M. and Sasaki, H.. Stimulations but not neuroleptics. *Geriatrics and Gerontology International*.2009; 9( 3): 217-219. **Text and opinion**
53. Ganzer, C. A.. Assessing Alzheimer's disease and dementia: best practices in nursing care. *Geriatric Nursing*.2007; 28( 6): 358-365. **Assessment focused not management**
54. Gatz, M., Fiske, A., Fox, L. S., Kaskie, B., Kasl-Godley, J. E., McCallum, T. J., Wetherell, J. L.. Empirically validated psychological treatments for older adults. *Journal of Mental Health and Aging*.1998; 4( 1): 9-39. **Not Residential specific**
55. Gauthier, S., Cummings, J., Ballard, C., Brodaty, H., Grossberg, G., Robert, P., Lyketsos, C.. Management of behavioral problems in Alzheimer's disease. *International Psychogeriatrics*.2010; 22( 3): 346-372. **Review article**
56. Gies, K. and Tremblay, R. D.. Farmer Fred... accepting, instead of contradicting, this demented patient's distorted perception of reality stopped catastrophic reactions. *Geriatric Nursing*.1991; 12( 5): 242-243. **Text and opinion**
57. Gill, S. S. and Seitz, D. P.. Association of antipsychotics with mortality among elderly patients with dementia. *American Journal of Geriatric Psychiatry*.2007; 15( 11): 983-984 **Mortality review.**

58. Gillibert, C., Desmeules, J., Vogt-Ferrier, N., Dayer, P.. Behavioural and psychological symptoms of dementia (BPSD): Pharmacological management. *Prise en charge médicamenteuse des symptômes comportementaux et psychologiques liés à la démence*.2006; 2( 61): 970-975. **Not in English**
59. Grinberg, A., Lagunoff, J., Phillips, D., Stern, B., Goodman, M., Chow, T.. Multidisciplinary design and implementation of a day program specialized for the frontotemporal dementias. *American Journal of Alzheimer's Disease and other Dementias*.2008; 22( 6): 499-506. **Not residential care**
60. Grossman, F., Okamoto, A., Turkoz, I., Gharabawi, G.. Risperidone in the treatment of elderly patients with psychosis of Alzheimer's disease and related dementias [8]. *Journal of the American Geriatrics Society*.2004; 52( 5): 852-853. **Not residential care**
61. Hall, K. A., Keks, N. A., O'Connor, D. W.. Transdermal estrogen patches for aggressive behavior in male patients with dementia: A randomized, controlled trial. *International Psychogeriatrics*.2005; 17( 2): 165-178. **Not residential care**
62. Hanagasi, H. A. and Emre, M.. Treatment of behavioural symptoms and dementia in Parkinson's disease. *Fundamental and Clinical Pharmacology*.2005; 19( 2): 133-146. **Not residential care**
63. Harrison, S.. Campaigner court action to oppose Alzheimer drugs' ruling. *Nursing Older People*.2006; 18( 10): 5-5. **Text and opinion**
64. Hemels, M. E., Lanctot, K. L., Iskedjian, M., Einarson, T. R.. Clinical and economic factors in the treatment of behavioural and psychological symptoms of dementia. *Drugs and Aging*.2001; 18( 7): 527-550. **Economic analysis**
65. Holmes, C., Hopkins, V., Hensford, C., MacLaughlin, V., Wilkinson, D., Rosenvinge, H.. Lavender oil as a treatment for agitated behaviour in severe dementia: A placebo controlled study. *International Journal of Geriatric Psychiatry*.2002; 17( 4): 305-308. **Not focused in residential care**
66. Holmes, C., Wilkinson, D., Dean, C., Clare, C., El-Okli, M., Hensford, C., Moghul, S.. Risperidone and rivastigmine and agitated behaviour in severe Alzheimer's disease: A randomised double blind placebo controlled study. *International Journal of Geriatric Psychiatry*.2007; 22( 4): 380-381. **Not focused in residential care**
67. Horn, S. D.. Improving clinical outcomes over the continuum of a patient's care. *Drug Benefit Trends*.2003; 15( 10): 32-36+39-40. **Text and opinion**
68. Hunt, N.. Setting the backdrop in caring for people with dementia. *Nursing Older People*.2007; 18( 12): 18-19. **Text and opinion**
69. Huybrechts, K. F., Rothman, K. J., Brookhart, M. A., Silliman, R. A., Crystal, S., Gerhard, T., Schneeweiss, S.. Variation in antipsychotic treatment choice across US nursing homes. *Journal of Clinical Psychopharmacology*.2012; 32( 1): 11-17. **Descriptive paper**
70. Javadpour, A., Ahmadzadeh, L., Bahredar, M. J.. An educative support group for female family caregivers: Impact on caregivers psychological distress and patient's neuropsychiatry symptoms. *International Journal of Geriatric Psychiatry*.2009; 24( 5): 469-471. **Not related to residential management of BPSD**

71. Kennedy, G. J. and Marcus, P.. Use of antidepressants in older patients with co-morbid medical conditions: Guidance from studies of depression in somatic illness. *Drugs and Aging*.2005; 22( 4): 273-287. **Review paper**
72. Kerzner, L. J.. Diagnosis and treatment of Alzheimer's disease. *Advances in internal medicine*.1984; 29( ): 447-470. **Text and opinion**
73. Kolcaba, K. and Miller, C. A.. Geropharmacology treatment: behavioral problems extend nursing responsibility. *Journal of Gerontological Nursing*.1989; 15( 5): 29. **Text and opinion**
74. Kricos, P. B.. Providing hearing rehabilitation to people with dementia presents unique challenges. *Hearing Journal*.2009; 62( 11): 39. **Not BPSD focused**
75. Krout, R. E. and Beathard, B.. Individualizing group music therapy for residents with dementia: challenges and strategies for data collection and presentation of treatment results. *American Journal of Recreation Therapy*.2007; 6( 1): 6-12. **Discussion paper**
76. Kverno, K. S., Black, B. S., Nolan, M. T., Rabins, P. V.. Research on treating neuropsychiatric symptoms of advanced dementia with non-pharmacological strategies, 1998-2008: A systematic literature review. *International Psychogeriatrics*.2009; 21( 5): 825-843. **Systematic review**
77. Landreville, P., Dicaire, L., Verrault, R., Lévesque, L.. A training program for managing agitation of residents in long-term care facilities: description and preliminary findings. *Journal of Gerontological Nursing*.2005; 31( 3): 34. **Prospective study**
78. Lawlor, B. A.. Behavioral and psychological symptoms in dementia: The role of atypical antipsychotics. *Journal of Clinical Psychiatry*.2004; 65( SUPPL. 11): 5-10. **Text and opinion**
79. Leone, A. F., Standoli, F., Hirth, V.. Implementing a Pain Management Program in a Long-Term Care Facility Using a Quality Improvement Approach. *Journal of the American Medical Directors Association*.2009; 10( 1): 67-73. **Focus on pain not BPSD**
80. Livingston, G., Johnston, K., Katona, C., Paton, J., Lyketsos, C. G.. Systematic review of psychological approaches to the management of neuropsychiatric symptoms of dementia. *American Journal of Psychiatry*.2005; 162( 11): 1996-2021. **Systematic review**
81. Lowery, D. and Warner, J.. Behavioural and psychological symptoms of dementia (BPSD): the personal and practical costs of dementia. *Journal of Integrated Care*.2009; 17( 2): 13-19. **Financial analysis**
82. Lucas, J., Bowblis, J., Gerhard, T., Chakravarty, S., Crystal, S.. Antipsychotic use among nursing home residents. *Pharmacoepidemiology and Drug Safety (PDS)*.2009; 18( S1): S143. **Drug description not management**
83. Luyendyk, K.. Using life histories to enhance dementia caregiving. *Canadian Nursing Home*.2007; 18( 1): 4. **Not pertaining to BPSD**
84. Maierà, E.. Old age depression and its treatment. *Psychiatria Danubina*.2010; 22( SUPPL. 1): S124-S125. **Not in english**
85. Marrocco, G. F.. Dementia and depression: a study of prevalence in an elderly residential setting. .1996; ED.D.( ): 134 p. **Prevalence study not related to BPSD or management**

86. McCabe, L.. A holistic approach to caring for people with Alzheimer's disease. *Nursing Standard*.2008; 22( 42): 50. **Text and opinion**
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# Appendix IV: JBI Critical Appraisal Instruments

## QARI

### JBI QARI Critical Appraisal Checklist for Interpretive & Critical Research

Reviewer ..... Date .....

Author ..... Year ..... Record Number .....

|  | Yes                      | No                       | Unclear                  | Not Applicable           |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Is there congruity between the stated philosophical perspective and the research methodology?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Is there congruity between the research methodology and the research question or objectives?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Is there congruity between the research methodology and the methods used to collect data?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Is there congruity between the research methodology and the representation and analysis of data?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Is there congruity between the research methodology and the interpretation of results?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Is there a statement locating the researcher culturally or theoretically?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Is the influence of the researcher on the research, and vice-versa, addressed?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Are participants, and their voices, adequately represented?   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Overall appraisal:  Include  Exclude  Seek further info.

Comments (Including reason for exclusion)

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# JBI Critical Appraisal Instruments MASTARI

## JBI Critical Appraisal Checklist for Randomised Control / Pseudo-randomised Trial

Reviewer ..... Date .....

Author ..... Year ..... Record Number .....

|   | Yes                      | No                       | Unclear                  | Not Applicable           |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Was the assignment to treatment groups truly random?                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Were participants blinded to treatment allocation?                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Was allocation to treatment groups concealed from the allocator?                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Were the outcomes of people who withdrew described and included in the analysis? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Were those assessing outcomes blind to the treatment allocation?                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Were the control and treatment groups comparable at entry?                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Were groups treated identically other than for the named interventions?          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Were outcomes measured in the same way for all groups?                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Were outcomes measured in a reliable way?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Was appropriate statistical analysis used?                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Overall appraisal:    Include                   Exclude                   Seek further info.

Comments (Including reason for exclusion)

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## JBI Critical Appraisal Checklist for Comparable Cohort/ Case Control

Reviewer ..... Date .....

Author ..... Year ..... Record Number .....

|   | Yes                      | No                       | Unclear                  | Not Applicable           |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| 1. Is sample representative of patients in the population as a whole?               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Are the patients at a similar point in the course of their condition/illness?    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Has bias been minimised in relation to selection of cases and of controls?       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Are confounding factors identified and strategies to deal with them stated?      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Are outcomes assessed using objective criteria?                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Was follow up carried out over a sufficient time period?                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Were the outcomes of people who withdrew described and included in the analysis? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Were outcomes measured in a reliable way?  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Was appropriate statistical analysis used?                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Overall appraisal:    Include                     Exclude                     Seek further info.

Comments (Including reason for exclusion)

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# Appendix V: JBI Data Extraction Instrument

## QARI

### JBI QARI Data Extraction Form for Interpretive & Critical Research

Reviewer ..... Date .....

Author ..... Year .....

Journal ..... Record Number .....

#### Study Description

Methodology  
\_\_\_\_\_  
\_\_\_\_\_

Method  
\_\_\_\_\_  
\_\_\_\_\_

Phenomena of interest  
\_\_\_\_\_  
\_\_\_\_\_

Setting  
\_\_\_\_\_  
\_\_\_\_\_

Geographical  
\_\_\_\_\_  
\_\_\_\_\_

Cultural  
\_\_\_\_\_  
\_\_\_\_\_

Participants  
\_\_\_\_\_  
\_\_\_\_\_

Data analysis  
\_\_\_\_\_  
\_\_\_\_\_

Authors Conclusions  
\_\_\_\_\_  
\_\_\_\_\_

Comments  
\_\_\_\_\_  
\_\_\_\_\_

Complete

Yes

No



# MAStARI

## JBI Data Extraction Form for Experimental / Observational Studies

Reviewer ..... Date .....

Author ..... Year .....

Journal ..... Record Number .....

### Study Method

RCT                       Quasi-RCT                       Longitudinal   
Retrospective                       Observational                       Other

### Participants

Setting \_\_\_\_\_

Population \_\_\_\_\_

### Sample size

Group A \_\_\_\_\_ Group B \_\_\_\_\_

### Interventions

Intervention A \_\_\_\_\_

Intervention B \_\_\_\_\_

Authors Conclusions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Reviewers Conclusions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Study results**

**Dichotomous data**

| <b>Outcome</b> | <b>Intervention ( )<br/>number / total number</b> | <b>Intervention ( )<br/>number / total number</b> |
|----------------|---|---|
|                |   |   |
|                |   |   |
|                |   |   |
|                |   |   |

**Continuous data**

| <b>Outcome</b> | <b>Intervention ( )<br/>number / total number</b> | <b>Intervention ( )<br/>number / total number</b> |
|----------------|---|---|
|                |   |   |
|                |   |   |
|                |   |   |
|                |   |   |

## Appendix VI: Characteristics of Included studies

### Qualitative Studies

| Study  | Methods                                       | Participants  | Intervention  | Outcomes   | Notes  |
|--|---|---|---|--|--|
| [36], Gerdner, L. A., 2005                   | Observational tools and open-ended interviews | 8 residents their carers and family                       | evaluating the effectiveness of a music therapy program | The effects of an individualized music program seem to outweigh the costs            | A mixed methods study which shows that music is an effective intervention  |
| [35], Götell, E., Brown, S., Ekman, S., 2009 | Interview and observation                     | Care workers and residential care residents with dementia | the effect of care giver singing                        | The effects of care giver singing can assist in enhancing positive mood and emotions | A valuable tool that can be easily implemented in all settings if done in a culturally appropriate and sensitive way |

### Quantitative Studies

| Study   | Methods                               | Participants  | Intervention A                                  | Intervention B                 | Notes   |
|---|---------------------------------------|---|---|--------------------------------|---|
| [41], Ballard, C. G., O'Brien, J. T., Reichelt, K., Perry, E. K., 2002  | Double blind randomized control trial | residents in nursing homes in the NHS in the UK                         | Aromatherapy oil applied to the face as a cream | Base cream applied to the face | Good evidence to use as an adjunct therapy and even trial as a primary treatment. Excellent points made about the use of anti-psychotics on a vulnerable population with little evidence to support their use. As this is a small trial agreed that much larger trials need to be conducted to assess effectiveness |
| [38], Brodaty, H., Ames, D., Snowdon, J., Woodward, M., Kirwan, J., Clarnette, R., Lee, E., Greenspan, A., 2005 | Double blind randomized control trial | Residents with a diagnosis of Alzheimer or mixed dementia and psychosis | Risperidone                                     | Placebo                        | Risk benefit is seen with the use of Risperidone on residents with psychosis and behaviours related to the psychosis. Highlights the importance of good assessment of residents and quick action when there is evidence of psychosis. This  |

|  |  |   |  |                              |   |
|--|--|---|--|------------------------------|---|
|  |  |   |  |                              | study acknowledged and referenced risk rats for falls and the Injury to the resident with the use of risperidone and this needs to be a significant factor in the overall treatment plan for this cohort. |
| [46], Cohen-Mansfield, J. Marx, M. S, Dakheel-Ali, M., Regier, B. Thein, K. and Freedman, L, 2010  | Cohort study   | 111 nursing home residents with a diagnosis of dementia who exhibit agitation                               | Agitated   | Not agitated or missing data | Targeted appropriate interventions requires to effectively assist in the management of BPSD   |
| [44], Cohen-Mansfield, J. and Werner, P., 1998   | Pseudo randomized control trial of wandering residents and the impact that the environment has on this behaviour | 27 residents who wandered and exhibited pacing behaviour  | Responses and time spent in a corridor set out in the with a nature theme and a home like theme.             | No change to the corridor.   | Effects of altered environment significant in managing wandering behaviours   |
| [48], Cohen-Mansfield, J., Dakheel-Ali, M., Thein, K., Marx, M. S., 2009                           | Descriptive case series  | 69 residents of four nursing homes with a diagnosis of Dementia   | Uses of different stimuli on residents and describing and measuring engagement with the activity             |                              | Good quality study showing how management can be achieved with simple targeted interventions  |
| [53], Cohen-Mansfield, J., Thein, K., Marx, M. S., Dakheel-Ali, M., 2012                           | Descriptive case series  | 89 agitated nursing home residents with dementia  | Looking at the barriers that exist when trying to implement non pharmacological interventions to manage BPSD |                              | Multiple barriers to the implementation of actions need to make actions to reduce BPSD a priority   |
| [52], Cornegé-Blokland, Esther, Kleijer, Bart C., Hertogh, Cees M. P. M., J., 2012                 | Cross sectional descriptive study  | Staff in 23 nursing home  | Questionnaire, interview and case study responses  |                              | The impact of antipsychotic medication is overestimated in care by staff and the safety of the medications is considered an acceptable risk   |
| [28], Crotty, M., Halbert, J., Rowett, D., Giles, L., Birks, R., Williams, H., Whitehead, C., 2004 | Randomized control trial   | Residents of aged care facilities who were admitted to a hospital and then followed up by specialist advice | Control  | Intervention                 | Behaviours were decreased in the control group to the intervention group at follow up and overall medication appropriateness was improved   |



|   |   |  |  |  |   |
|---|---|--|--|--|---|
| [26], Ervin, Kaye, Finlayson, Sarah, Cross, Maddalena, 2012   | Cross sectional descriptive study   | Staff in residential care facilities in rural Australia  | Questionnaire, interview and case study responses  |  | Support is required for staff to implement non pharmacological interventions  |
| [39], Frank, L., Kleinman, L., Ciesla, G., Rupnow, M. F. T., Brodaty, H., 2004  | Double blind randomized control trial   | 279 residents of aged care facilities which are taking risperidone or a placebo. Looking at the measurement of effect of the medication on the nursing burden. | Placebo  | risperidone 0.25mg two times per day up to a total dose of 2mg | Noted that the effect of the risperidone reduced at 4 weeks and that the observational tool M-NCAS correlated with the CMAI shows the subjectiveness of the observational scales  |
| [51], Khan, F. and Curtice, M., 2011  | Cross sectional descriptive study   | Questionnaire, interview and case study responses  | Education to staff and expert assistance from experienced experts in behaviour management  |  | Significant impact of education and support to staff in applying non-pharmacological strategies and improved medication appropriateness   |
| [43], Luttenberger, Katharina, Donath, Carolin, Uter, Wolfgang, Graessel, Elmar, 2012   | Randomized control trial  | 139 residents with a diagnosis of dementia   | MAKS multi-component group therapy consisting of tasks organized into three categories (M) Motor stimulation (A)Activities of daily living (K) cognition (s) Spiritual 30 mins motor exercises, 30 mins of cognitive exercises and 40 mins ADL such as making sandwich | Normal Activities of a nursing home not structures             | This is a significant size study that was undertaken over a long time. The use of the NOSGAR scale shows excellent outcomes. This activity based intervention is very effective in residents who have some degree of mobility |
| [42], Peskind, E. R., Tsuang, D. W., Bonner, L. T., Pascualy, M., Riekse, R. G., Snowden, M. B., Thomas, R., Raskind, M. A., 2005 | Double blind randomized control trial   | 31 residents in care with Alzheimer disease and persistent disruptive behaviors  | Propranolol 120mg per day other usual medications maintained   | Placebo  | Good comparative study which makes good points about the use of medication to effect and the importance of the measurement of side effects.   |
| [50], Pitkala, K. H., Laurila, J. V., Strandberg, T. E., Tilvis, R. S., 2004  | Cross sectional descriptive study of Psychiatric and behavioral symptoms over a two week period | 425 consecutive patients over 70 facilities  | Observation of prevalence of symptoms  |  | High usage of medication to manage behaviours as these subjects were recruited from a hospital situation the level of delirium or psychosis consistent with a specific  |

|   |                                       |   |  |  |  |
|---|---------------------------------------|---|--|--|--|
|   |                                       |   |  |  | population which would be receiving medications to assist with behavioural management  |
| [37], Pollock, B. G., Mulsant, B. H., Rosen, J., Mazumdar, S., Blakesley, R. E., Houck, P. R., Huber, K. A., 2007 | Double blind randomized control trial | Selected from a university hospital which treated patients from nursing homes which exhibited BPSD.                     | Citalopram   | Risperidone  | Significant drop out rate in this trial. Important points made about the tolerance of the medication. Also significant point made about the inability to undertake ethical placebo based trial on nursing home residents with dementia |
| [47], Ramadan, F. H., Naughton, B. J., Prior, R., 2003  | Randomized control trial              | 431 residents from five skilled nursing facilities residents with less than 4 episodes in a 2 week observational period | Looks at the treatment patterns of residents with clinical significant behaviour disturbances  | Treatment of patients without clinically significant behaviours. | No direct correlation between the treatment and the behaviour clusters.  |
| [40], Ruths, S., Straand, J., Nygaard, H. A., Bjorvatn, B., Pallesen, S., 2004                                    | Randomized control trial              | 55 patients who have been taking haloperidol, risperidone or Olanzapine for BPSD  | Residents ceased anti-psychotic medication   | Remained on Anti-psychotic medication                            | Excellent evidence to show that the long term use of anti-psychotics for BPSD is something that needs to be closely monitored  |
| [49], Zuidema, S. U., De Jonghe, J. F. M., Verhey, F. R. J., Koopmans, R. T. C. M., 2011                          | Cross sectional descriptive study     | Nursing home patients   | Observations of staff distress and how it correlated to the environment and then the physicians perception of the residents behaviors. |  | Important points made the quality of nursing home environment and the distress it causes staff and then how this information is passed on to the prescriber.   |

## Appendix VIII: List of study findings / Conclusions

### Use of individualized music by trained staff and family: translating research into practice

|              |  |
|--------------|--|
| Finding 1    | Music is a catalyst for meaningful interactions between the staff and residents  |
| Illustration | It made it easier to work with her. pg. 26   |
| Finding 2    | Music assisted in improving responsiveness   |
| Illustration | when i turn the music on, the elderly ladies come into mom's room and they set down on the bed. Mom doesn't interact a whole lot anymore. However two or three times i have walked in and there was mom's roommate and two or three others sitting on the bed and they are actually talking cause they are listening to the music. They love Frank Sinatra so I think it helps with socialization pg. 28 |
| Finding 3    | Effects of music   |
| Illustration | It has a calming effect pg. 27   |
| Finding 4    | Effects of music   |
| Illustration | She seemed to calm down when they put it on and she seemed to enjoy it. When she gets anxious she gets confused. When I turn on the music it gets rid of the anxiety and id you kept listening to the music and start talking t her she would normally come back to where she knew where she was pg. 27-28   |
| Finding 5    | Effects of music   |
| Illustration | It seemed to wipe the frown off her face it seemed to give her pleasure pg. 28   |

**The influence of caregiver singing and background music on vocally expressed emotions and moods in dementia care: a qualitative analysis**

|              |  |
|--------------|--|
| Finding 1    | The carers usual care the enthusiasm that is expressed by carers irritates patients  |
| Illustration | There was an overall disparity between the energy expressed by the carer and the patient, " Wash yourself a little," Carer prompts in a vigorous and friendly way. "oy, oy, oy" the patient answers with a thin and weak voice. pg. 426  |
| Finding 2    | The use of background music helps the patient match the enthusiasm for the task to the carer   |
| Illustration | Caregivers and persons with dementia seemed excited when expressing mutual warmth and playfulness. Such a situation is described here when the waltz " Den gamle dansbanen " (the old dance Pavilion) played in the background. " Patients name Carer says sounding happy and enticing. Yes Patient answers sounding dreamy and friendly. " Step into the skirt here," Carer continues sounding positive and enticing the patient laughs with delight. Pg. 427 |
| Finding 3    | Singing creates an overwhelmingly positive emotion and mood  |
| Illustration | " Oh thanks dearest," Patient says with appreciation, friendliness, and calmness. " You're welcome. It was nothing," C replies with warmth and energy. " It was a lot for me, " Patient says with satisfaction pg. 428   |
| Finding 4    | People with Dementia seem to understand the context of the text  |
| Illustration | When one of the caregivers sang the waltz " Kostervalsen " (the Koster Walz) whos last line is s proposal of marriage, the person with dementia responded in a playful manner " Maja, sweetheart, hey do you want to marry me?" Carer sings the words to the song, sounding open playful and rhythmic. Patient laughs in a delighted manner, and then happily replies " Ok. I'll do that " pg. 428   |

## Appendix IX Joanna Briggs Levels of Evidence

| Levels of Evidence | Feasibility F(1-4)  | Appropriateness A(1-4)  | Meaningfulness M(1-4)   | Effectiveness E(1-4)   | Economic Evidence  |
|--------------------|---|---|---|--|--|
| 1                  | Metasynthesis of research with unequivocal synthesised findings   | Metasynthesis of research with unequivocal synthesised findings   | Metasynthesis of research with unequivocal synthesised findings   | Meta-analysis(with homogeneity) of experimental studies (eg RCT with concealed randomisation) OR One or more large experimental studies with narrow confidence intervals | Metasynthesis (with homogeneity) of evaluations of important alternative interventions comparing all clinically relevant outcomes against appropriate cost measurement, and including a clinically sensible sensitivity analysis |
| 2                  | Metasynthesis of research with credible synthesised findings  | Metasynthesis of research with credible synthesised findings  | Metasynthesis of research with credible synthesised findings  | One or more smaller RCTs with wider confidence intervals OR Quasi-experimental studies(without randomisation)  | Evaluations of important alternative interventions comparing all clinically relevant outcomes against appropriate cost measurement, and including a clinically sensible sensitivity analysis                                     |
| 3                  | a. Metasynthesis of text/opinion with credible synthesised findings<br><br>b. One or more single research studies of high quality | a. Metasynthesis of text/opinion with credible synthesised findings<br><br>b. One or more single research studies of high quality | a. Metasynthesis of text/opinion with credible synthesised findings<br><br>b. One or more single research studies of high quality | a. Cohort studies (with control group)<br><br>b. Case-controlled<br><br>c. Observational studies(without control group)  | Evaluations of important alternative interventions comparing a limited number of appropriate cost measurement, without a clinically sensible sensitivity analysis  |
| 4                  | Expert opinion  | Expert opinion  | Expert opinion  | Expert opinion, or physiology bench research, or consensus   | Expert opinion, or based on economic theory  |