Masters Research Project Thesis

Using academic detailing to support nurses' knowledge and confidence around antipsychotic drugs in dementia

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Signed statement of sources

I certify that the work presented in this thesis, to the best of my knowledge, is original and my own work, except when references have been made in text. The thesis contains no material previously published or submitted for a degree at any other university or tertiary institution.

Acknowledgements

ABSTRACT

Aim: Antipsychotic agents are frequently prescribed for behavioural and psychiatric symptoms of dementia, despite being of limited efficacy for many patients and possessing a potential to cause serious harm. This project aimed to increase the knowledge and confidence that aged care nurses have about the use of antipsychotic agents in dementia.

Methods: 20 nurses working in five residential care homes in the Brisbane area took part in an academic detailing session about use of antipsychotic agents in dementia. The academic detailing session focused on four key messages around correct use, safety and efficacy for these drugs in dementia. The nurses' knowledge and confidence around the use of antipsychotic drugs in dementia was measured pre-and-post intervention with a multiple choice quiz and a survey.

Certainty based assessment was used to assess nurses' knowledge regarding the use of antipsychotics in dementia and the confidence with which the nurses held this knowledge. The quiz was scored such that respondents that were more often correct with confidence scored higher than those that were correct with low confidence or confidently incorrect. The primary assessment of the effectiveness of the academic detailing session was the median change in quiz score. Secondary endpoints included changes in the number of correct answers on the quiz and changes in survey score.

Results: 16 of the 20 nurses who received the education responded to the follow-up quiz and survey, a response rate of 80%. The median quiz score increased from 9.5 points to 21.0 points (p = 0.002) on a scale from -60 to $+30$ points. The median number of correct answers on the same quiz increased from 7 to 9 out of 10 (p = 0.0002). Respondents reported a high degree of confidence in the survey before and after the academic detailing session.

Conclusion: A targeted academic detailing session improved nurses' knowledge and confidence about the use of antipsychotic drugs in dementia. Most importantly, participants were more likely to be right and confident they were right.

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1. INTRODUCTION

1.1 Antipsychotic drugs in dementia

Dementia is a debilitating disease which is expected to increase in prevalence as the Australian population ages. In addition to cognitive decline, dementia is associated with a number of distressing behavioural and psychiatric symptoms. Symptoms include hallucinations and delusions, aggression and restlessness, as well as loss of interest and lack of motivation, sadness, anxiety and low self-esteem (1). It is estimated that 90% of dementia patients will experience one or more of these symptoms, commonly referred to as behavioural and psychiatric symptoms of dementia (BPSD), at some stage during the course of the illness (1).

Non-drug interventions are recommended as first-line treatment for BPSD, after underlying causes and possible contributing factors have been ruled out. Pharmaceuticals should be considered only when non-drug alternatives have failed or in cases of severe aggression and distress to the patient or carers. Antipsychotics are the most commonly prescribed medications for behavioural and psychiatric symptoms in dementia. However, the effect sizes are small, and not all patients will benefit. In addition, antipsychotics have been associated with a number of serious adverse effects when used in this frail patient population. In Australia the atypical antipsychotic risperidone is the only antipsychotic subsidised for BPSD (2).

Antipsychotics are frequently used in elderly people. Studies from US and Canada have found that up to a third of residents in aged care facilities are prescribed an antipsychotic (3-7). A survey undertaken in 40 Sydney nursing homes in 2003 found that 25.1% of the residents were prescribed an antipsychotic. Furthermore, 80% of the residents who were administered antipsychotics did not have a diagnosis of schizophrenia (2). A study examining patterns of antipsychotic medication use in Australia from 2002 to 2007 revealed that atypical antipsychotic drugs were most commonly used for schizophrenia in younger men and for BPSD in older women (8). The authors found that the atypical antipsychotics were used extensively outside the approved subsidised indications of schizophrenia and bipolar disorder, with a significant financial burden to the PBS (8). A US survey about psychotropic medications using 2005 prescribing data revealed that 7.4% of antipsychotic drug prescriptions were for delirium, dementia, amnestic or other cognitive disorders (9). Use for

this group of indications was the third most frequent, after mood disorders and schizophrenia/other cognitive disorders (9).

Extensive use of antipsychotics for dementia-patients is not a new concern: Use of antipsychotics in the elderly has been a target for numerous QUM initiatives both in Australia and internationally for decades, yet the prescribing continues to be high. Interventions previously carried out in this field have included regular multidisciplinary team meetings and staff education including academic detailing. A Swedish study on monthly multidisciplinary team meetings in 33 nursing homes was successful in reducing antipsychotic prescribing by 19% (10). In an open, uncontrolled study of a single nursing home in Montreal, Canada, Monette and colleagues piloted an interdisciplinary educational program of six months duration, including consciousness-raising, educational sessions and clinical follow-up (11). The authors concluded that the program successfully reduced the number of patients receiving antipsychotics, as well as decreasing the frequency of disruptive behaviour (11). A UK cluster RCT of an education package involving training and support of care home staff found a 19.1% reduction in the proportion of nursing home patients taking antipsychotics (12). Three US randomised, controlled trials of academic detailing to nursing home physicians all resulted in decreased antipsychotic use in participating homes (13-15). These three studies also included education of nursing home staff. On the other hand, an Australian randomised controlled trial from 2004 did not find a decrease in antipsychotic prescribing following an educational outreach intervention aimed at physicians in 20 nursing homes (16).

In a recent position statement on antipsychotic medications and dementia, Alzheimer's Australia claims that antipsychotics are overused in Australia as a first-line therapy in dementia patients (17). The organisation further states that the risks are likely to outweigh the benefits of use in up to 80% of the 50 - 100 000 Australian dementia patients receiving an antipsychotic (17). Alzheimer's Australia therefore calls for initiatives to address this issue within all levels of the health-care system. This emphasizes the ongoing need for interventions to support quality use of medicines within this setting. In light of the high prescribing and emerging data on the harms of these drugs, we wished to undertake a quality use of medicine project about antipsychotics in nursing-home residents with dementia.

There has been a number of studies and initiatives aiming to support quality use of medicines in dementia patients receiving an antipsychotic agent. Our study differs from previous work by focussing on nurses' knowledge and confidence regarding antipsychotic use in patients

with dementia. Nurses working in aged care play an important role in caring for patients with dementia. Our study is timely in that it follows increasing evidence regarding antipsychotic harms, which has seen antipsychotic over-use receive world-wide media attention.

1.2 Efficacy of antipsychotic drugs in dementia

Antipsychotics are only efficacious for some of the symptoms associated with dementia. A Cochrane-review of atypical antipsychotics in dementia found risperidone and olanzapine to have significant efficacy for the treatment of aggression, and risperidone to be efficacious for psychosis in dementia (18). Another Cochrane-review suggests that the first-generation antipsychotic haloperidol is effective at reducing aggression (19). Importantly, the effect size is small even in these symptoms. (20). When 17 placebo-controlled trials on atypical antipsychotics in dementia were included in a pooled analysis, the effect-sizes were found to border on the minimum clinically observable change threshold: The mean change in the Neuropsychiatric Inventory total score (used as a measure for the total global outcome) was a 35% improvement compared with baseline (21). On this scale, an improvement of 30% compared with baseline is defined as the effect-size needed to observe a minimal change in symptoms (22). There was a 3.41 point difference between treatment and placebo in the pooled NPI total score (21), which is below the threshold for observable change defined as 4 points (22).   In addition, the placebo-response in the studies was generally high, and drop-out-rates were in the magnitude of 30 per cent in most studies (20). Antipsychotics are unlikely to benefit other symptoms, such as wandering, disruptive vocalisation and shouting. (23).

1.3 Adverse effects of antipsychotics

Antipsychotics have been associated with a number of serious adverse events in patients with dementia. Lately, there have been several coronial investigations after antipsychotic use has been linked to deaths in dementia patients. The CATIE-AD trial concluded that the adverse effects of atypical antipsychotics offset their advantages when used for behavioural and psychiatric symptoms in Alzheimer's disease patients (24). In a meta-analysis of 15 placebo controlled trials of atypical antipsychotics in dementia, patients receiving atypical antipsychotics were more likely to die (OR = 1.54: 95 % CI 1.06 to 2.23, p = 0.02) (25). This

meta-analysis suggests that there may be as much as one additional death for every 100 dementia-patients treated with an atypical antipsychotic for 10 – 12 weeks. A 2005 analysis from the US Food and Drug Administration found a similar increase in mortality risk associated with atypical antipsychotics (26), and black-box warnings were added to the labels of atypical antipsychotics. Black-box warnings were added for all antipsychotic drugs in 2008, after subsequent studies found a comparable, if not higher, risk of death with the conventional antipsychotics (27-29). The majority of deaths were due to cardiovascular events or infections, such as pneumonia (23).

The Dementia Antipsychotic Withdrawal Trial (DART-AD) found an increased long-term risk of mortality when antipsychotics were prescribed for Alzheimer's disease patients (30). In this discontinuation trial, patients were randomised to either continue antipsychotic treatment for 12 months or to receive placebo. Patients were followed for 24 – 54 months after enrolment. A reduction in survival was found for patients randomised to continue their antipsychotic compared with patients in the placebo-group: After 24 months follow-up 71% of residents who had ceased their antipsychotic were still alive, compared with only 46% of residents who were randomised to continue treatment. The DART-AD trial did not include enough participants to allow causes of death to be analysed (30, 31).

Antipsychotics have been associated with an increased risk of transient ischaemic attacks and strokes, both fatal and non-fatal. The Cochrane-review of atypical antipsychotics in dementia found there to be an almost fourfold increased risk of serious cerebrovascular adverse events associated with risperidone-use (18). A meta-analysis by Schneider et al found a significant increased risk of cerebrovascular adverse events with all atypical antipsychotics, and with risperidone in particular (20). The biological mechanism behind a potential increased risk of cerebrovascular adverse events is still unknown, and further research is needed.

Other side effects associated with atypical antipsychotics in dementia include somnolence, falls, extrapyramidal disorders, abnormal gait, asthenia and peripheral oedema (18). An Australian study found that use of both typical and atypical antipsychotics in the elderly is associated with an increased risk of hospitalization for hip fracture and pneumonia (32).

1.4 Antipsychotic guidelines

Australian guidelines recommend limiting use of antipsychotics in BPSD to patients that have a low or an average risk of stroke (33). Treatment with an antipsychotic should only be considered in cases of intractable aggression or in psychosis that has not responded to psychosocial interventions (33). The guidelines further recommend using the second-generation antipsychotics risperidone and olanzapine, as these agents have been more extensively studied in the dementia population than the first-generation drugs, and have fewer extrapyramidal adverse effects at low doses (33).

1.5 Use of academic detailing to improve quality use of medicines

The number of people with dementia in Australia is predicted to triple between 2005 and 2030 (1). The widespread use of antipsychotics in the elderly, combined with the limited benefits and significant potential for harm, emphasizes the importance of the appropriate use of these drugs. We developed an academic detailing program for nurses working in aged care facilities in an attempt to address this evidence-practice gap.

A systematic review of interventions to optimise prescribing in aged care homes found that evidence for effective interventions is limited, but that education including academic detailing has the strongest evidence (34). The study suggests that academic detailing together with educational reinforcement and follow-up should be directed towards all groups of healthcare workers (34). Educational interventions directed towards doctors alone were found less effective than educating both nurses and physicians (34, 35). Audits and feedback only lead to a small or moderate impact on professional practice and healthcare outcomes (36).

Academic detailing is a methodology for educational outreach where evidence-based information on a selected topic is provided to health professionals in a one-to-one setting (37-40). The targets for such educational sessions are typically areas where prescribing is known to be sub-optimal (41). The focus of academic detailing is on tailoring information to the individual health professional's needs, and understanding the motivation behind behaviour plays an important role (37). Several studies have demonstrated that academic detailing is an effective strategy for changing behaviour and improving prescribing (37-39). Academic detailing is also proven to be cost-effective (40). Avorn et al showed that an educational program targeted towards physicians, nurses and assistants in nursing was successful in

reducing the use of psychoactive drugs in nursing homes (14). In this study, physicians in the six participating nursing homes received an academic detailing session by a pharmacist. The nurses and the assistants did not receive academic detailing, but participated in four training sessions around the topic.

The studies on academic detailing have mostly focused on interventions directed towards doctors, however, some experience exists with academic detailing being used with nurses.

Nurses play a key role in caring for patients with dementia living in aged care facilities. Importantly, they are responsible for implementing non-drug interventions. When a patient is prescribed an antipsychotic drug, nurses are responsible for monitoring patient response, including the efficacy and safety of antipsychotics. Nurses also provide important feedback to GPs on resident behaviour, and may therefore have an impact on GP decision-making and prescribing of antipsychotics. In a UK study of reasons why psychiatrists prescribe psychotropic medications for dementia patients, pressure from nursing staff to prescribe antipsychotics emerged as an important factor, along with lack of resources and suitable alternatives to antipsychotic medications (42). Therefore, there is reason to believe that targeting an educational program towards nurses working in residential care homes has the potential to lead to improved use of antipsychotics in this population

The use of antipsychotics in dementia may be suboptimal. There is evidence that academic detailing is effective in changing behaviour and improving prescribing. Nurses play an important role in implementing non-drug strategies, monitoring benefits and side-effects of antipsychotic drugs and feeding back to doctors on patient response. Therefore it was decided to develop an academic detailing programme around antipsychotics for nurses working in aged care facilities.

1.6 Aim

The aim of this study is to increase nurses' knowledge and confidence around use of antipsychotic drugs in dementia-patients by delivering an academic detailing program to nurses working in aged care facilities.

2. METHODS

2.1 Recruitment of nurses and administration of the academic detailing programme

The consultant pharmacist co-supervising our project provides clinical services to six residential care facilities in the Brisbane area. These six facilities were all invited to participate in our educational program.

The managers at each facility provided names of nurses who were interested in participating. Information about the project with a consent form, a quiz and a survey were emailed to each facility prior to the session. Nurses interested in participating were instructed to complete the quiz and survey prior to the academic detailing session. Informed consent was also obtained from each participant prior to the session. Each nurse was given a different quiz to fill out after the session, along with the same survey as previously. The nurses were instructed to return the completed quizzes and surveys to The University of Queensland in a pre-addressed envelope within a week after the session. Email reminders were sent to the participating nursing homes a week after the last academic detailing session to improve the response rate.

2.2. Development of academic detailing material

The academic detailing program was developed based on a literature search and discussion with nurses and pharmacists working in the area. The program was designed to take approximately 15 minutes to deliver and consisted of four key messages. A two-page, laminated academic detailing card was designed to be used in the session and to be given to each nurse after the session was finished. The academic detailing card was reviewed by the project co-supervisor, and three other pharmacists: two experienced academic detailers and one clinical pharmacist with a special interest in geriatrics and psychiatry. The material was also reviewed by managers of the participating nursing home group to ensure it met the organisation's learning needs.

In addition to the academic detailing card, each nurse received a print-out of NPS Prescribing Practice Review 37 (23).

2.3. Assessment of intervention

The effectiveness of the academic detailing session was measured with a before and after quiz (Quiz A and Quiz B, appendices 2 and 3 respectively). The quizzes consisted of ten questions each assessing a concept related to the material on the academic detailing card. The quizzes were designed to be equivalent. The order of the quizzes was switched mid-way through the project. The presence of an effect of the order of the quizzes was tested statistically. The ten concepts measured in the MCQs are listed in Table 1.

Table 1: MCQ concepts

1	Ability to identify antipsychotics by brand and generic name
2	Knowledge about effectiveness of non-drug therapies
3	Knowledge about symptoms not responding to antipsychotics
4	Knowledge about symptoms responding to antipsychotics
5	Knowledge about serious adverse effects (death and stroke risk)
6	Knowledge about other side-effects
7	Knowledge about monitoring of benefits and adverse effects
8	Knowledge about frequency of reviewing therapy
9	Knowledge about duration of therapy and when to expect symptom-relief
10	Knowledge about symptom return when antipsychotics are ceased

Certainty based assessment is a method for assessing knowledge as well as how certain the test subject is about their knowledge. In addition to providing an answer to a multiple choice questionnaire, the subjects are asked to rate the certainty they have in their answer. Then, the combination of whether the answer is correct or false with the certainty level stated by the test subject leads to either scoring marks or being given a penalty. The score on the certainty-based marking scheme was the primary endpoint. The quiz was scored according to the following scale:

Table 2: Certainty-based marking scheme, adapted from Garner-Medwin et al (43)

Degree of certainty:	Low	Mid	High	No answer
Mark if correct:	1	2	3	0
Penalty if wrong:	0	-2	-6	0

A correct answer with high certainty scores 3 points, while being confident but wrong leads to a penalty of – 6 points. The total score on the quiz may therefore range between – 60 to + 30 points.

A statistically significant improvement in score post-intervention indicates that the intervention has been successful in improving nurses' knowledge and confidence. Improvement in the quiz score without the certainty-based component, i.e. the number of correct answers on the quiz (from 0 to 10), was a secondary endpoint.

A survey (appendix 4) was developed consisting of 8 statements related to confidence administering antipsychotic agents to dementia patients. This survey was given to the participants before and after the academic detailing programme had been delivered. The participants were asked to indicate their agreement with each statement on a 5-point Likert-scale, rating from Strongly Disagree (1 point) to Strongly Agree (5 points).

A per-question analysis was also performed. This analysis looked at frequencies of each score for all the 160 questions (10 quiz questions x 16 participants). The post-pre score differences for all the 160 questions was calculated and displayed in a frequency table.

2.4 Data analysis

The data were analysed using SPSS for Windows Version 18.0 and Microsoft Office Excel.

The two-sided null hypothesis was that the intervention would lead to no change in the nurses' quiz scores.

The planned analysis depended on tests of whether the difference in quiz scores or number of correct answers was normally distributed. If normal, the data was to be analysed using a paired t-test. If the data failed statistical tests for normality, non-parametric methods were to be used, specifically: the Wilcoxon signed-rank test.

The data regarding survey scores were expected to be non-normal, and it was therefore decided to use non-parametric tests when analysing the survey scores.

For the per-question scores, a Wilcoxon signed rank test was performed with the alternative hypothesis that the true location-shift of scores is not equal to zero.

A p-value of less than 0.05 was considered significant.

2.5 Ethical considerations

The nurses were given information about the project and what participation would mean for them. The nurses were informed that participation was voluntary and that they could withdraw from the study at any time without any consequences.

Data for each individual was compared pre and post intervention. To avoid having easily identifiable information on the quiz and survey forms each participant was asked to put a code on their response forms. The code was created using the participant's mother's maiden name, or alternatively the name of the participant's primary guardian. Using this name, the participant created the code by taking the second letter of each name and combining it with the month that the parent or guardian was born. For example, if the participant's mother's maiden name was Liv Raanes, and she was born in April, the code written on the quiz is IA04.

The project did not involve any patient participation, nor did it involve collecting patient sensitive data regarding medication use or their medical records. Ethical approval was sought from the School of Pharmacy Ethics Committee. The protocol for the project was also approved by the nursing-home group.

3. **RESULTS**

3.1 Demographics

Out of the 6 nursing homes contacted, 5 participated. Twenty nurses, a majority of the RNs and EENs in the five facilities, participated in the educational activity. Sixteen nurses returned the post-education quiz (response rate: 80%). The responders were four Endorsed Enrolled Nurses and 12 Registered Nurses. Nine respondents indicated that they worked in a dementia specific unit. Further demographic details are provided in Table 3.

Table 3: Demographics of responders

	Frequency (%)
Years of experience:	
0 – 5 years	9 (56.2)
6 – 15 years	4 (25.0)
> 15 years	3 (18.8)
Profession:	
Endorsed enrolled nurse	4 (25.0)
Registered nurse	12 (75.0)
Area of work:	
Dementia-specific unit	9 (56.2)
Regular unit	6 (37.5)
Missing information	1 (6.3)

3.2 Quiz results

Normality of data was tested for, and both quiz scores and the number of correct answers were found to be non-normal.

Results from an independent Mann-Whitney U test showed there was no statistically significant difference in test-scores depending on which order quizzes was given.

Wilcoxon signed-rank tests were performed for pre-and-post intervention quiz scores and number of correct answers. There was a statistically significant difference in quiz score (the primary endpoint), before and after the intervention. The median quiz score was 9.5 points before the academic detailing session, and 21.0 points ($p = 0.002$, exact test) after. There was

also a statistically significant change in the number of correct answers, a secondary endpoint. The median was 7 correct answers prior to the educational session, and 9 afterwards (p = 0.0002, exact test). Before the intervention, the mean score per correct answer was 0.82 points, which had increased to 1.69 points after the intervention.

Table 4: Medians and inter-quartile ranges for quiz-score and number of correct answers before and after intervention

	Median (IQR)
Quiz-score	
Pre-intervention	9.5 (1.3 – 13.5)
Post intervention	21.0 (8.3 – 21.0)
Difference post-pre	6 (3.5 – 13.0)
Number of correct answers	
Pre-intervention	7.0 (5.3 – 8.0)
Post intervention	9.0 (7.0 – 9.0)
Difference post-pre	1 (1.0 – 2.0)

The four nurses who failed to complete the follow-up had pre-scores similar to the population median.

Figure 1 shows a plot of the changes in quiz-score and the changes in the number of correct answers for all the 16 nurses that responded.

Figure 1: Changes in quiz-scores and change in the number of correct answers before and after the academic detailing session.
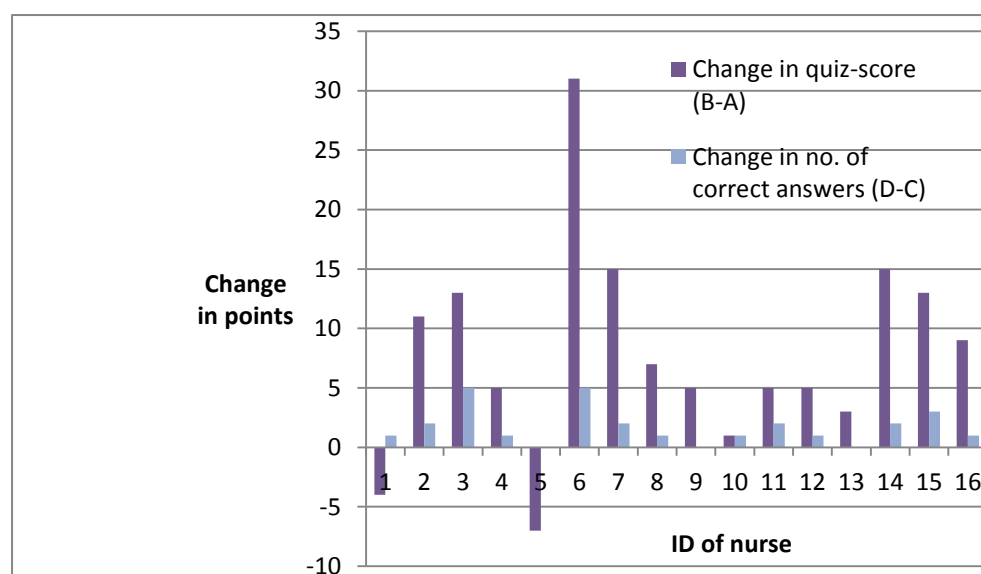
The frequencies of correct answers for each of the ten concepts are shown in figure 2. The figure shows that the frequency of correct answers was higher after the intervention for all but two of the concepts. The nurses' performance improved markedly in concept 5 and 7.

Figure 2: Frequency of nurses answering correctly on each concept before and after intervention
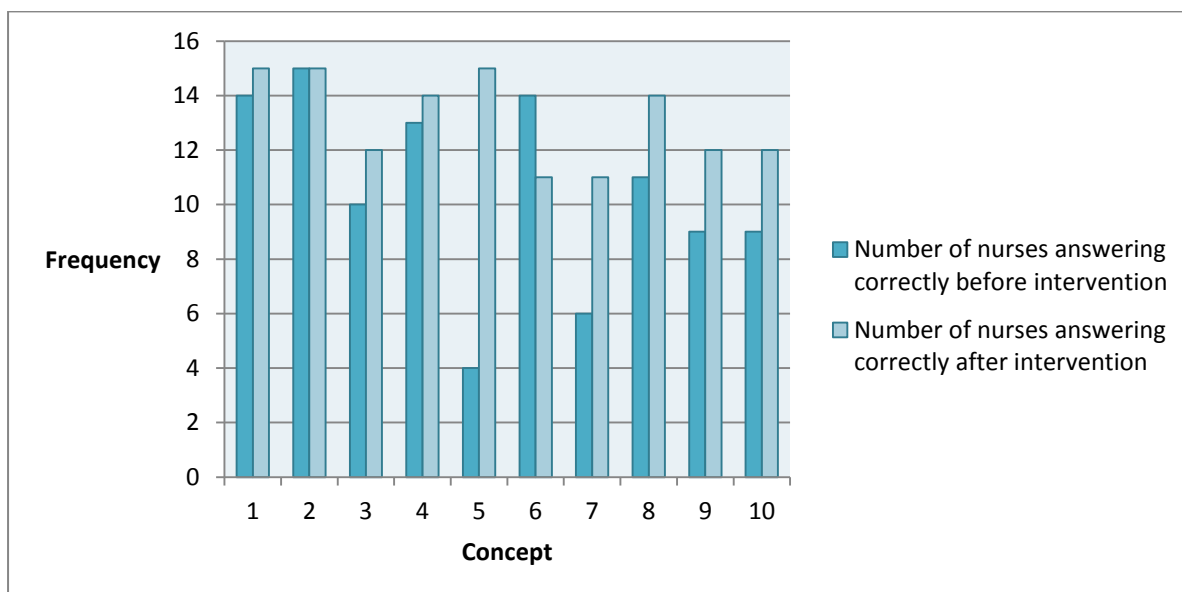

Figure 3 shows the distribution of scores per question before and after the intervention. Prior to the intervention, 58 of the 160 answers were answered correctly with a high certainty (score 3) compared to 111 after the intervention.
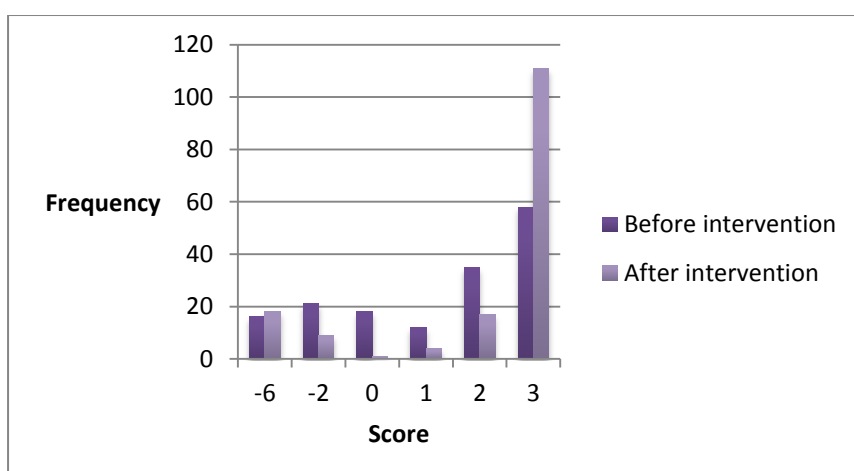
Figure 3: Frequency of scores

Figure 4 shows the difference in post-pre scores. Median difference was 0 points, with an IQR of $0 - 3$. The possible scores range from -6 to $+ 3$, which gives a minimum post-pre score difference of -9, and a maximum of 9. The figure shows that for 60 of the answers, there was no difference in the score after the intervention. The figure also shows that the majority of the differences are greater than zero, hence there has been an increase in scores after the intervention. A Wilcoxon signed rank test showed that there was a statistically significant difference in test-scores (V = 1594, p = 0.002).

Figure 4: Post-pre difference in question scores
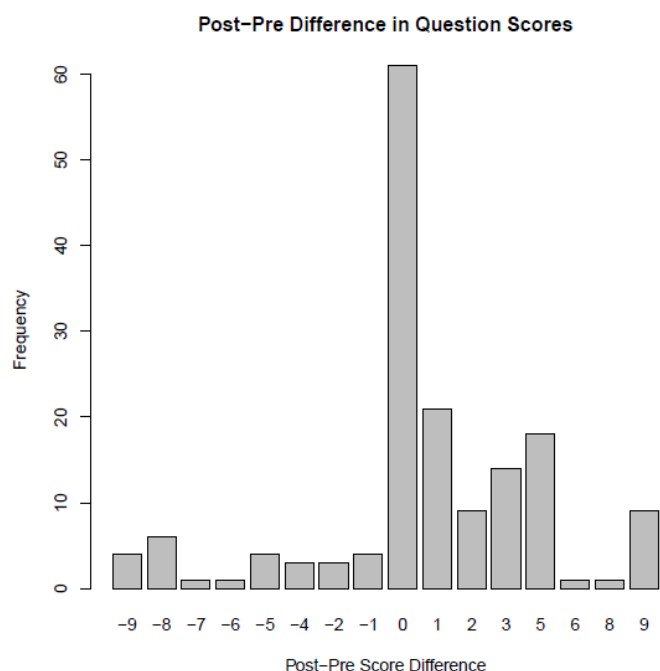
3.3 Survey results

Table 5 shows the median scores and interquartile ranges for the eight survey questions before and after the educational intervention. The table shows that the level of confidence in the nurses was high prior to the educational session, and increased after the intervention. The median score on all of the survey questions was 4 ("Agree") before the intervention. The median score had increased to 5 for survey questions 1 and 2 after the intervention, to 4.5 for question 3, 4 and 6, but remained unchanged for question 5, 7 and 8.

Table 5: Median score and interquartile ranges for each survey question before and after intervention

Survey question	Pre intervention Median (IQR)	Post intervention Median (IQR)
1	4 (4.0 – 5.0)	5 (4.0 – 5.0)
2	4 (4.0 – 5.0)	5 (4.0 – 5.0)
3	4 (3.5 – 5.0)	4.5 (4.0 – 5.0)
4	4 (3.0 – 4.0)	4.5 (4.0 – 5.0)
5	4 (4.0 – 4.0)	4 (4.0 – 5.0)
6	4 (4.0 – 4.0)	4.5 (4.0 – 5.0)
7	4 (4.0 – 4.0)	4 (4.0 – 5.0)
8	4 (4.0 – 5.0)	4 (4.0 – 5.0)

Survey question 8 asked about nurses' confidence about overall having the necessary skills and knowledge to administer antipsychotic drugs in dementia. Before the intervention 86.7% agreed or strongly agreed on this question, corresponding to a score of 4 or 5 on the Likert-scale. After the intervention 100% agreed or strongly agreed.

4. DISCUSSION

4.1 Quiz

In this study, an educational intervention in the form of an academic detailing session was undertaken to support nurses working in aged care facilities. The academic detailing session improved nurses' knowledge and confidence on topics related to the quality use of antipsychotics in dementia.

There was a statistically significant increase in our primary endpoint, the median change in score on a multiple choice questionnaire employing certainty based assessment.   The quiz score represents a combination of nurses' knowledge and the veracity of their confidence: The increase in quiz score can be thought of as "more accurately knowing what you know". A conventional multiple choice quiz doesn't distinguish between someone who truly knows a correct answer and someone who has arrived there by a guess or a process of elimination (44). People who answer incorrectly may either be aware of not knowing the answer, or they may be misinformed with a high degree of confidence. Therefore, two responders who obtain the same score on a multiple choice quiz may differ significantly in their clinical performance (45). A person who lacks confidence in their knowledge may act hesitantly and less reliably (46). On the other hand, someone who is confident but misinformed is likely to make poor decisions (47). In a health-care setting, both these scenarios may contribute to medical errors (48). Utilising certainty-based assessment gave us an insight into people's awareness of their knowledge that could not have been measured simply with a number of correct answers on a multiple choice quiz. This type of insight into knowledge is considered to indicate a more likely link between knowledge and appropriate practice (49).

The median quiz score before our intervention was 9.5 out of 30 possible points, which had increased to 21.0 points after the educational session (p = 0.002, Wilcoxon signed rank-test).At the same time, the median number of correct answers increased from 7 (out of a maximal score of 10) to 9 points (p = 0.0002, Wilcoxon signed rank-test). While the change in the number of correct answers was modest, the change in quiz score was of a larger magnitude. An increase in quiz score can be attributed to an increase in the number of correct answers on the quiz, gaining more points per correct answer and/or being penalised less when an answer is incorrect. Before the intervention, the mean score per correct answer was 0.82 points, which had increased to 1.69 points after the intervention. An interpretation of this is

that the participating nurses have increased their awareness of their knowledge, as well as the actual knowledge itself.

Looking at the per-question analyses, the majority of post-pre score differences were positive. The frequency of questions answered correctly with high certainty nearly doubled after the intervention. There was no difference in score for 60 questions. This is consistent with nurses who scored 3 for a question on the pre-quiz attaining this score for the corresponding question on the post-quiz. Together, these results support our finding that the nurses' insight into their knowledge has been improved.

4.2 Survey

Looking at the survey results, it appears that the nurses had a high level of confidence about their knowledge on the topic studied even before receiving the education. Before the intervention, 86.7% agreed or strongly agreed to overall having the necessary skills and knowledge around antipsychotic medicines in dementia. After the intervention 100% agreed or strongly agreed to this question. However, the scores on the quizzes suggest that some of this confidence may have been misplaced prior to the education. For example, only 25% of the participants answered correctly on the questions concerning serious adverse effects of antipsychotics prior to the intervention. Also the relatively low median score of 9.5 points out of 30 points before the intervention could point to the nurses either being unsure about their knowledge, or not knowing when they answered wrongly.

The high confidence reported pre-intervention together with the increase in the quiz-score supports our finding that the intervention has been successful in improving the nurses' insight into their knowledge: After the intervention the nurses' confidence in their knowledge seems to be better matched to their actual knowledge.

4.3 Main limitations of the study

A limitation of this study is that the methods employed make it impossible to conclusively prove that the improved quiz score was principally due to the educational intervention. The nurses were all given the academic detailing card and a NPS prescribing review around antipsychotics in dementia, which they were allowed to refer to when answering the post

educational quiz. It is likely that being given this written material would lead to some improvement in scores without attending an academic detailing session. Including a control group would have indicated the extent that the positive findings were due to the educational intervention. A control-group was not used due to the project's primary focus on providing an educational intervention and then assessing that intervention (as opposed to the primary focus being the assessment of the intervention). This is why we selected an intervention with the strongest evidential support for effectiveness.

Providing the nurses with the written information without the academic detailing session might lead to a higher quiz score. However, it is unlikely that this approach alone would have led to the increased awareness of knowledge found in this study. Extensive evidence exists that academic detailing improves knowledge and changes behaviour, while providing written information only is less efficacious. A Cochrane review has concluded that giving written educational material to health care professionals may have a small effect on improving process outcomes, such as awareness, knowledge, attitudes, skills and professional practice (50). The review suggests that solely providing written information did not have any effects on patient outcomes. The review included one randomized controlled trial by Avorn et al on academic detailing. Physicians were allocated to a group receiving academic detailing, a group receiving written information only, or a control group receiving no intervention (38). Academic detailing was found superior to providing written material only. No statistically significant difference was found between the control group and the print-only group, while the group of physicians receiving academic detailing reduced their prescribing of target drugs by 14 per cent compared with controls (p = 0.0001).

Therefore it is likely our intervention would improve the nurses' knowledge, awareness and confidence more than just providing them with the written information alone.

Order of quizzes

2 different quizzes were developed to ensure an improvement post-intervention would not be due to participants completing the same quiz twice. Swapping the order of the quizzes halfway was done to rule out that an improvement in quiz-scores could result from the first quiz being easier than the second. The quizzes administered pre- and post-intervention were

not found to differ significantly in difficulty, implying that the improvements seen were not likely to be caused by one quiz being easier than the second.

Use of confidence-based assessment

We used confidence-based assessment to address the certainty with which the nurses possessed information around the quiz topics. Very little research has been done using this technique in this setting. Confidence-based assessment has mostly been used on examinations for medical and biomedical students, and is not widely utilised in practice-based settings. When used for university students, the methodology has been critiqued for the possibility that students may "game" their answers to get the highest possible overall score, when knowing how the tests are scored (43). The nurses were not made aware that answering wrongly but being confident their answer was correct was attracting a penalty. Neither did they know that the highest score came from answering correctly with high confidence. Therefore, we find it unlikely that gaming of answers would have been an issue in our research.

4.4 Suggestions for future research

The endpoints chosen in this study were improvement in knowledge and confidence. The question remains whether empowering nurses will have an impact on clinical outcomes. It would be interesting to address whether the usage of antipsychotics decreased in the nursing homes in the months following the intervention. Another point that could have been investigated is whether improving knowledge and confidence leads to changes in nurses' behaviour in any way: One aspect that would have been interesting to look at, is whether the use of non-drug strategies for behavioural symptoms increased in the participating homes. It would also be interesting to know whether the nurses now raise the topic about ceasing an antipsychotic with the GP more frequently than before the intervention. If the investigation has led to changes in behaviour, another aspect to investigate could be whether this is a long-term effect or a more transient change in behaviour. These topics could be addressed in further research.

4.5 Applicability to clinical practice

Consultant pharmacists working in aged care facilities take part in a number of clinical activities to promote safe and effective use of medicines. Our intention was to assess an intervention that could be utilized by aged care pharmacists, perhaps as part of funding available to pharmacists conducting resident medication reviews.

Nurses participating gave feedback that one-on-one education was appreciated, as the education could be targeted to each person's individual information needs. This could be useful in a nursing home setting, where the EENs and the RNs have the same responsibilities, but have different levels of education. Another advantage with academic detailing in this setting is that it is a practical solution in a hectic work environment. Only one nurse at a time needs to be away from the ward, making it easier to organize an academic detailing session than a group-session with all the nurses in the facility. Consultant pharmacists could perhaps time the session with their 3-monthly resident medication reviews, taking time to see 1-2 nurses per visit. Nurses absent that day could get the educational session the next time the consultant pharmacist visits. This way, academic detailing could be offered without needing to utilize more resources.

While this educational session based on academic detailing was well-received and led to statistically significant changes in all endpoints, there are several factors that may limit the applicability of academic detailing to this area. Firstly, the development of the academic detailing material was a lengthy process. The researcher conducted the project full-time as part of a master degree in clinical pharmacy, and could therefore commit solely to investigating the literature and developing an evidence-based intervention for several months. Secondly, in order to conduct an academic detailing program successfully, the facilitator needs to have solid knowledge on the methodology and strong communication skills. The researcher was trained in academic detailing as part of the diploma in clinical pharmacy at the University of Queensland, and also received additional training and feedback from the main supervisor, who is an experienced academic detailing facilitator. Workshops in academic detailing are conducted by the National Prescribing Service, but a minority of Australian consultant pharmacists currently have received such training. However, with the increasing number of pharmacy graduates eager to take on new roles within the profession, this could change in the future.

5. CONCLUSION

In this study we have successfully developed and conducted an academic detailing program that increased the knowledge, confidence and self-awareness of nurses caring for dementia patients receiving antipsychotic drugs.

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7. APPENDICES

Appendix 1: Instructions for quiz and survey

Managing behavioural symptoms in dementia

The enclosed quiz and survey have been developed to assess the effectiveness of the academic detailing session. All responses remain anonymous. So that it is possible to compare your quiz and survey results before and after the academic detailing session we ask that you provide a code that you use for the forms used before and after the academic detailing session.

Creating your code. Create the code using your mother's maiden name, or alternatively the name of your primary guardian. Take the second letter of the first name and surname and combine it with the month that your parent or guardian was born. As an example, Beate's mother's maiden name is Liv Raanes, and she was born in April. Therefore, Beate's code is: IA04.

Quiz instructions. All questions are related to the use of antipsychotics for behavioural and psychiatric symptoms in dementia-patients (NOT other indications, e.g. treatment of schizophrenia). There is only one correct alternative for each question.

Please take your time to answer all the multiple choice questions, as well as indicate your level of certainty for each question in the appropriate box in the column to the right. If you are sure your answer is correct: indicate your certainty level as "high''. If your response was a guess: indicate your certainty level as "low". If your response falls between these levels: indicate your certainty level as "mid".

Keep in mind that the aim of the quiz is to assess the effectiveness of the academic detailing session and *not* to test your knowledge. Your responses will not be linked to any identifying information.

Survey instructions. Please indicate your level of agreement with each statement.

Thank you for participating in our research!

Appendix 2: Quiz A

Participant code:
I work in a dementia specific unit: YES ☐   NO ☐
I am a: Registered Nurse ☐   Endorsed Enrolled Nurse   ☐   **Years of experience as a nurse**:   ☐ 0 – 5   ☐ 6 – 15   ☐ More than 15

	Certainty level		
	High	Mid	Low
1. Which of these medicines is an antipsychotic agent: ☐ Risperidone (Risperdal, Risperidone, Rixadone) ☐ Temazepam (Normison, Temtabs, Temaze) ☐ Nortriptyline (Allegron)	☐	☐	☐
2. Evidence exists that music therapy can be efficacious in treating behavioral symptoms of dementia ☐ True ☐ False	☐	☐	☐
3. Antipsychotics are NOT EFFECTIVE in which of the following symptoms associated with dementia: ☐ Hallucinations ☐ Aggression ☐ Wandering	☐	☐	☐
4. Antipsychotics are EFFECTIVE in which of the following symptoms associated with dementia: ☐ Hoarding ☐ Hearing voices ☐ Memory impairment	☐	☐	☐

5. If 100 dementia patients are treated with risperidone for 12 weeks, how many deaths are – statistically – associated with using this drug? ☐ 0 ☐ 1 ☐ 5	☐	☐	☐
6. Muscular rigidity can be a side-effect of antipsychotic drugs, and is an example of an: ☐ Extrapyramidal symptom ☐ Anticholinergic effect	☐	☐	☐
7. When starting therapy with an antipsychotic drug, blood pressure should be measured at baseline and… ☐ within the first 48 hours ☐ within the first week ☐ within the first 14 days	☐	☐	☐
8. Antipsychotics therapy should be reviewed by the GP: ☐ Every six months ☐ Every three months ☐ Every month	☐	☐	☐
9. Which of the following statements is CORRECT about the duration of antipsychotics therapy in dementia patients ☐ Antipsychotics should be used indefinitely to prevent relapses ☐ Duration of treatment should be limited to up to a year ☐ When the patient is symptom free, a trial to cease the drug should be initiated by the patient's GP	☐	☐	☐
10. What is the fraction of patients that will experience no increase in symptoms if their antipsychotic is ceased ☐ More than half ☐ Less than half	☐	☐	☐

Appendix 3: Quiz B

Participant code:

I work in a dementia specific unit: YES ☐   NO ☐

I am a: Registered Nurse ☐   Endorsed Enrolled Nurse ☐
Years of experience as a nurse:

☐ 0 – 5   ☐ 6 – 15   ☐ More than 15

	Certainty level		
	High	Mid	Low
1. **Which of these medicines is an antipsychotic agent:** ☐ Temazepam (Normison, Temtabs, Temaze) ☐ Olanzapine (Zyprexa) ☐ Nortriptyline (Allegron)	☐	☐	☐
2. **Evidence exists that aromatherapy can be efficacious in treating behavioural symptoms of dementia** ☐ True ☐ False	☐	☐	☐
3. **For which of these symptoms are antipsychotics in dementia NOT EFFECTIVE** ☐ Shouting ☐ Aggression ☐ Hearing voices	☐	☐	☐
4. **For which of these symptoms are antipsychotics in dementia EFFECTIVE :** ☐ Aggression ☐ Cognitive defects ☐ Pacing	☐	☐	☐

5. **The risk of stroke in dementia-patients using antipsychotics, compared with patients not receiving antipsychotics, is:**

   ☐ Lower

   ☐ Higher

   ☐ The same

   ☐ ☐ ☐

6. **Constipation can be a side-effect of antipsychotic drugs, and is an example of an:**

   ☐ Extrapyramidal symptom

   ☐ Anticholinergic effect

   ☐ ☐ ☐

7. **When starting therapy with an antipsychotic drug, target behaviour should be monitored:**

   ☐ Daily

   ☐ Weekly

   ☐ Monthly

   ☐ ☐ ☐

8. **Antipsychotics therapy should be reviewed by the GP:**

   ☐ At least every six months

   ☐ At least every three months

   ☐ At least every month

   ☐ ☐ ☐

9. **What is the fraction of dementia-patients that will experience increased symptoms if an antipsychotic is ceased**

   ☐ More than half

   ☐ Less than half

   ☐ ☐ ☐

10. **Clinical improvement from antipsychotic therapy in dementia should be expected within:**

    ☐ A month

    ☐ Two months

    ☐ Three months

    ☐ ☐ ☐

Appendix 4: SURVEY

Participant code:
I work in a dementia specific unit: YES ☐   NO ☐
I am a: Registered Nurse ☐   Endorsed Enrolled Nurse ☐   **Years of experience as a nurse**:   ☐ 0 – 5   ☐ 6 – 15   ☐ More than 15

Statement	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
1. I am able to seek underlying causes for behavioural symptoms in dementia (e.g. constipation or dehydration)	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
2. I am able to assess the need for non-drug strategies, e.g. music therapy	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
3. I am able to implement non-drug strategies	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
4. I know which behaviours are likely to benefit from antipsychotic medicines	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
5. I am able to judge when a resident is responding to antipsychotic medicines	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
6. I am able to identify adverse effects that are common when starting antipsychotic medicines	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
7. I am able to detect when a patient may benefit from ceasing an antipsychotic	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
8. Overall, I feel confident that I have the necessary skills and knowledge to administer antipsychotic medications to residents with dementia.	Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Appendix 5: Participant information sheet

Please take time to read the following information and decide whether or not you wish to take part.

What is the name of this research project?

Effectiveness of academic detailing in supporting nurses administering antipsychotic medicines to residents in aged care facilities with dementia

What is the purpose of this research project?

Behavioural and psychiatric symptoms often present significant challenges for patients with dementia, their family and their carers. Antipsychotics are often used as part of the management of behavioural and psychiatric symptoms in patients with dementia. Antipsychotics help some behavioural and psychiatric symptoms in patients with dementia, but they do not help all symptoms or all patients, and they have been associated with serious adverse events. Nurses working in aged care facilities play an important role in caring for residents with dementia. This includes administering and monitoring antipsychotic medicines as well as behavioural therapy and usual care.

This study assesses the use of academic detailing to support nurses' administering antipsychotics to residents with dementia living in nursing homes.

Why have I been chosen?

Registered Nurses and Endorsed Enrolled Nurses caring for patients with dementia and working in Anglicare Southern Queensland aged care facilities in the Brisbane area are invited to participate.

What will happen if I take part?

The project consists of a one-on-one educational session with a clinical pharmacist (and researcher) and the completion of a pre- and post-educational session questionnaire and quiz.

The researcher will come to your workplace and deliver an educational session related to quality use of antipsychotic drugs. The educational session will take 15 minutes.

Prior to the educational session you will be asked to fill out a quiz and a survey relating to the topic that the education will focus on. The quiz will be a multiple choice questionnaire. In addition to answering each question, you will also be asked to state how sure you are that each of your answers is correct. The survey will ask you to rate on a scale how confident you

feel around various aspects related to antipsychotic drugs in dementia. The combination of the quiz and the survey should take around 15 minutes to answer.

The same survey and a quiz similar to the first will be given to you after you have participated in the educational session. The purpose of the quiz and the survey is to assess whether the educational session was effective, and whether it may be beneficial for clinical pharmacists working in nursing homes to start using this technique to improve quality use of medicine. The educational technique described is called "academic detailing" and is routinely used with doctors. Academic detailing has been found to support improved prescribing.

Participation in the research project is voluntary and you can withdraw your consent at any time without any consequences.

Will data be kept confidential?

Only non-identified data will be collected for the purpose of the research. We would like to compare data for each individual participant before and after the educational session. Therefore, when answering the quiz and the survey you will be asked to provide us with a unique code only known to yourself, instead of your name or any other details that could identify you. You will use the same code when completing the quiz and the survey the second time. The data will not be made available to anyone except the researchers.

What will happen to the results of the research project?

The results of this project will contribute to quality use of medicine for residents in the contributing aged care facilities.

The researcher, Beate Antonsen, is a pharmacist and a student at the University of Queensland. This project is part of the researcher's Master of Clinical Pharmacy degree and will be published as her master's thesis. Results may also be published in a pharmacy journal in Australia or internationally.

A report of the research can be requested when the project is completed. Please contact project staff (Beate Antonsen, email beate.antonsen@gmail.com) to arrange to have the finished report sent to you.

Who can I contact for further information?

This study adheres to the Guidelines of the ethical review process of The University of Queensland. You are welcome to email the main researcher Beate Antonsen, beate.antonsen@gmail.com, should you have any further questions or concerns. Should you prefer to speak to an officer of the University not involved in the study, you may contact the Ethics Officer on 33653924.

Appendix 6: Consent Form

I confirm that I have read and understood the information sheet for the above project and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason, without my legal rights being affected.

I agree to participate in the study.

(Name of nurse)   (Signature)   (Date)

(Name of Researcher)   (Signature)   (Date)

Appendix 7: Academic detailing card page 1

MANAGING BEHAVIOURAL SYMPTOMS IN DEMENTIA

Developed by Beate Antonsen in association with Think Clinical Pharmacy 2012

Seek underlying causes for symptoms

- Constipation
- Dehydration
- Difficulties with hearing or vision
- Infection
- Medication
- Pain
- Environmental factors
- Psychiatric diagnoses

A chart review of 408 dementia patients found that verbal agitation had significant associations with pain and physical illness[1]

Consider non-drug strategies

✓ Non-drug therapies are preferred first-line due to a favourable balance between benefits and harms[2]

While Cochrane reviews have found insufficient evidence for effect, another systematic review suggests that the following non-drug strategies may be beneficial[3]:

Changes to bathing routines, such as bed-baths	Personalised music
Ability-focused carer education	Aromatherapy
Tapes of family members	Muscle relaxation therapy

Antipsychotics have modest benefits and may cause serious harms

BENEFITS

Antipsychotics have a small effect on aggression and psychosis[4]

Antipsychotics are ineffective for many symptoms in dementia

The modest benefits of antipsychotics in dementia	Effect-sizes needed to observe minimal change in symptoms[5]	Effect-sizes seen in studies[6]
Improvement on global symptom score	30 %	35 %
Difference in global symptom score between treatment and placebo	4 points	3.41 points

HARMS

A Systematic review showed that for every 100 dementia patients treated for 10-12 weeks with an atypical antipsychotic, 1 death was associated with the antipsychotic use[7]

Monitor for benefits and adverse events

Monitor:
- Target behaviour
- Blood pressure
- Body weight
- Lipids
- Glucose
- Extrapyramidal symptoms
- Anticholinergic effects

Clinical improvement should be expected within 12 weeks[9]. GP should discontinue the treatment and reassess the patient if there is no improvement in symptoms[10]

Patient should be reviewed by a GP at least every 3 months[10]

Behavioural and psychiatric symptoms of dementia are often temporary. If symptoms are under control, the GP should gradually try to reduce dose and possibly cease the drug[10]

Percentage of dementia-patients experiencing increased symptoms 3 months after ceasing antipsychotic[11]
- Increase in symptoms
- No increase in symptoms

Appendix 8: Academic detailing card page 2

Managing Behavioural Symptoms in Dementia

Monitor behaviour

Common underlying causes of behavioural symptoms
- ✓ Constipation
- ✓ Dehydration
- ✓ Hearing- or vision-problems
- ✓ Infection
- ✓ Medication
- ✓ Pain
- ✓ Psychiatric diagnoses
  - Anxiety or depression

Seek underlying causes for behavioural symptoms

Treatments shown to have effect
- Bed-baths
- Personalised music
- Ability-focused carer education
- Tapes of family members
- Muscle relaxation therapy
- Aromatherapy

Try non-drug strategies

The following symptoms respond poorly to antipsychotics
- ✗ Cognitive defects
- ✗ Disruptive vocalization
- ✗ Inappropriate voiding
- ✗ Incontinence
- ✗ Insomnia
- ✗ Pacing
- ✗ Repetition
- ✗ Shouting
- ✗ Touching
- ✗ Wandering
- ✗ Withdrawal

Antipsychotics may be effective for some distressing symptoms

What to monitor for	When to monitor
Target behaviour	Weekly
Blood pressure	At baseline, then within first week of treatment
Body weight	Baseline
Lipids	Baseline
Glucose	Baseline
Extrapyramidal symptoms (e.g. abnormal movements of the face, arms, legs or trunk)	Continuously
Anticholinergic effects (e.g. dry mouth, constipation, urinary hesitancy or delirium)	Continuously
Signs of sedation	Continuously
Postural hypotension	Continuously

Monitor for benefits and adverse effects

Regularly assess need for antipsychotic

Symptoms under control: Trial to cease antipsychotic (by the GP)

Residents should be reviewed by a GP every 3 months
2/3 of patients experience no increase in symptoms when the antipsychotic is stopped

Appendix 9: References for academic detailing card

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