Resident Aggression and Quality of Care in Long-term Care

by

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in

Aging

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Abstract

Purpose: My aim in this thesis was to investigate the relationship between resident aggression towards care aides and quality of care in long-term care (LTC).

Design: This is a paper-based thesis comprised of an introduction and overview, a critical review of the literature and an empirical study, which is a secondary analysis.

Theoretical Framing: The research model was created following Arnetz and Arnetz's model (2001) and variable selection was guided by the clinical microsystems literature.

Methods: A literature review, found in Appendix 1, and a manuscript in which I report on a project addressing the question: *What is the effect of high levels of unit resident aggression on quality of care*? prepared for submission to a peer-reviewed journal, comprises this thesis. The project is a secondary analysis of unit level data from the Translating Research In Elder Care (TREC) program using multiple regression models. The existing data included a sample of nursing home care aides (from the TREC survey) and residents (from the Resident Assessment Instrument –Minimum Data Set 2.0 (RAI-MDS) also collected in TREC) aggregated to 103 units from 36 LTC facilities across Alberta, Saskatchewan, and Manitoba. The final analytical sample had 100 units. A total of 1497 care aides' individual data were aggregated to the 100 units. A cross-sectional sample of 4220 resident assessments that matched the survey data collection were aggregated to the unit level in order to derive risk adjusted quality indicators (QIs) (decline in ADL's, worsening pain, pressure ulcers, restraint use). In the models, QIs were the dependent variables and resident aggression was the independent variable while we controlled for several unit and care aide characteristics.

Results: The literature review showed that resident aggression and quality of care in LTC are not well studied. Much of the research focused on effects of resident aggression on care aides instead of on the residents. The empirical study showed that at the unit level resident aggression was

associated with a lower percent of pressure ulcers but was not related to resident declining activities of daily living, worsening pain or restraint use. Owner-operator model (public not for profit vs. private for profit) and urban vs. rural classification in which a unit was located were the most consistent predictors of quality of care.

Conclusions: My findings add to our understanding of how resident aggression experienced by care aides may affect quality of care. I discuss the contributions of this thesis to theory, research, knowledge and practice. I offer insight on the contribution of resident aggression to quality of care, suggest additional research opportunities and comment on the need for further research.

Preface

This thesis is an original work by Heather L. Carleton. The research project, of which this thesis is a secondary analysis of, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "BUILDING CONTEXT - AN ORGANIZATIONAL MONITORING PROGRAM IN LONG-TERM CARE PROJECT 1 ON THE TRANSLATING RESEARCH IN ELDER CARE [TREC] PROGRAM", No. Pro00003304. This thesis project, Project Name "RESIDENT AGGRESSION AND QUALITY OF CARE IN LONG TERM CARE" received research ethics approval from the University of Alberta Research Ethics Board November 6, 2013, No. ID Pro00043378. No part of this thesis has been previously published. The research model referred to in Chapter 1 and 2 was designed by myself through modification of Arnetz and Arnetz's 2001 model, the data analysis in chapter 2 are my original work, as well as the literature review in Appendix 1.

Chapter 2 of this thesis will be submitted for publication as H. L. Carleton, C. A. Estabrooks, S. E. Slaughter, and D. Schopflocher, "Resident Aggression and Quality of Care In Long-term Care" to *BMC Geriatrics*. I was responsible for the literature review, data analysis and manuscript composition. D. Schopflocher assisted with interpreting and directing data analysis and with edits to the methods and results. S. E. Slaughter contributed by reviewing the manuscript. C. A. Estabrooks was the supervisory author and was involved in manuscript composition and edits.

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CHAPTER 1

Introduction and Overview

This thesis is the product of a masters program of education and research. The purpose of my research was to study the relationship between care aide experienced resident aggression and quality of care in long-term care (LTC). The presence of resident aggression toward care aides may adversely affect quality of care and quality of life for LTC residents. A possible mechanism for this is a negative work environment created with high rates of resident aggression that affects staff, and indirectly, affects the quality of care they provide.

Context of the Problem

The Canadian population is aging. Projections show by 2056 the proportion of Canadians 65 and older will more than double; the proportion of older adults 80 and over will triple[53]. The aging process for many older adults includes declining function and cognitive abilities. Dementia is the most significant cause of disability among Canadians aged 65 and older[2] and has been demonstrated as a key factor to nursing home institutionalization[56, 57]. Today dementia affects approximately 500,000 Canadians; within a generation this number is expected to more than double[2]. With its progressive nature and without cure, prevalence and incidence of dementia will continue to increase[62]. With this, a 10-fold increase in demand for LTC is estimated in Canada[2]. Care aides, unregulated, non-professional care workers, provide the majority of direct care to older adults in Canada's LTC facilities[33]. Care aides currently have the least amount of education and training of health care workers in nursing homes[11]. Yet, older adults presenting to LTC are increasingly older, with more advanced stages of dementia and/or chronic disease states and thus are more dependent requiring highly complex care[26].

Dementia, which requires some of the most complex care, is the most common diagnosis in LTC[10, 26]. Dementia involves a collection of symptoms that significantly interferes with one's daily functioning and relationships, negatively influencing one's quality of life. Both the loss of cognitive capacity (i.e., executive function, memory, reasoning, communication) and non-cognitive features of dementia such as behavioral and psychological symptoms (i.e., wandering, agitation, shouting, hording and inappropriate language) – often affect people with dementia[6,58]. These symptoms are demanding and create significant challenges for caregivers[1]. Some of the most challenging behavioral symptoms that care staff face are aggressive behaviors (defined

according to its operationalization in this study as violent behavior including verbal threats, hitting, spitting, biting and pinching).[20, 38]

Aggression is commonly elicited as one type of 'responsive behavior', which is a term "originating from, and preferred for, persons with dementia that represents how their actions, words and gestures are a response, often intentional, to something important to them"[42]. For example, situations of personal care have been associated with high incidences of aggression suggesting residents may misinterpret such care for personal violation or intrusion of personal space[12, 29, 51]. It is important to note that the term 'aggression', which replaced 'violence'[22], was the almost universal term in dementia care literature[46] to describe this behavior. However, there is a transition occurring in the literature where 'aggression' is being replaced with the preferred term of 'responsive behavior'. Although recognizing this transition, the terms 'resident aggression' and 'aggression' are used in this paper because of its original operationalization in the parent study and to capture previous literature on this topic.

Although aggressive behavior is a well-recorded phenomenon in LTC[46, 63], causes of aggression in older adults are multifaceted and not fully understood[9, 29]. Resident aggression has been associated with care provider characteristics[21, 40] and organizational conditions[27, 51]. Resident characteristics such as cognitive impairment and especially dementia have been linked with resident-to-staff aggression[46, 59]. Frequent triggers of aggressive behaviour are clinical issues of resident pain, dehydration, hunger, urinary, chest and dental infections[9, 12]. One systematic review of resident aggression in LTC reported a large variance in prevalence and incident rates but did report rates as high as 1.2 incidents per day[63]. Rates are however thought to be seriously underestimated – with 60 to 80% of incidences not reported[7, 8, 22, 25, 39]. High rates of resident aggression directed at care staff have consequences for both the care staff and the residents.

Consequences for care aides include emotional distress, psychological problems, and physical injuries. Dealing with aggression has been reported as the most difficult aspect of a care aide's job[20, 38] and most care aides feel they cannot control, change or modify the situation[23, 38, 41]. Experiencing resident aggression has been associated with care aide psychological trauma and fear for personal safety[49], burnout[18, 19, 25, 37], job dissatisfaction[34], distress and job strain[40]. Additionally, there have been several reports of care aide injuries resulting from resident

aggression and a significant proportion of the injuries were serious enough to require medical attention[4, 23, 25, 54].

Consequences for residents involve suspected diminished quality of care by adversely affecting staff-resident relationships and triggering negative care aide responses such as avoidance and use of physical and pharmacological restraints. Resident aggression has led to care aides feeling fear, anger, frustration, resentment and responding negatively by withdrawing, distancing, avoiding, and even changing the way they cared and treated those residents[4, 22, 36, 38, 41, 50]. Qualitative studies of care aides' experience of aggression have reported negative consequences for residents that included the reluctance of staff to spend time with them or answer their call lights, ignoring requests for assistance, and delays in attending to the residents' needs[22, 35, 41]. Care aides, in one study, perceived the care they delivered to aggressive residents as lower quality[38]. The presence of resident aggression has been reported as one of the main factors associated with increased number of quality deficiencies in US nursing homes[30]. Negative care aide responses to residents may also lead to perpetuation of resident aggression and to responses of being aggressive or abusive themselves, having a further negatively impacting quality of care[21].

Restraint and medication use have been described as additional responses to aggressive behavior[41, 45]. Both physical and pharmaceutical restraint have a long history in management of aggression in patients with cognitive impairment and they continue to be used in LTC despite major policy shifts from restraint use[15] and their adverse effects. The use of psychotropic medications for example, not only carry risks of serious adverse effects, but can also lead to over sedation, perpetuation of aggression, confusion and agitation, increased risk of falls and death[5, 14, 32]. Thus, resident aggression is an important factor to investigate in the quality of care of the vulnerable older adult population in LTC.

Research Question

What is the effect of high levels of unit resident aggression on quality of care?

Design

My thesis research was comprised of two projects. The first project was a literature review that identified gaps in the literature and was used to prepare the thesis proposal and prepared me for

the empirical study. These results are placed in Appendix 1. They will be crafted as a critical literature review for publication after the thesis defense. The second project was an empirical one. Its results have been prepared for publication in *BMC Geriatrics*; the manuscript is found in chapter 2.

Project #1: Resident aggression and quality of care in long-term care: A critical literature review

The first project of this thesis was a critical review of the research literature (Appendix 1) focused on resident aggression directed at care staff because of my interest in the effect of aggression on quality of care delivered to the residents.

Project #2: Resident aggression and quality of care in long-term care

In this project I examined the relationship of resident aggression and quality of care at the resident care unit level in a secondary analysis using multiple regression models guided by Arnetz and Arnetz's 2001 theoretical framework[3] and the clinical microsystem literature. A major focus in the literature is the significant prevalence and incidence of resident aggression in LTC. Researchers have been studying resident aggression and the ramification on care aides; however one area that has not been studied is the effect of resident aggression toward care staff on the quality of resident care. I was interested in quality of care in LTC and the potential effect of resident aggression as a negative unit characteristic. I had unit level data available to study this relationship.

Theoretical Framing

Arnetz and Arnetz's 2001 theoretical framework[3] (Figure 1) of possible consequences of violence towards care staff on the quality of care guided this study. In this model, violence experienced by care staff has a negative association with the quality of health care services. This model stems from Wallis' 1987 schematic model[60], which linked the negative effects of work stress on job satisfaction, and thus on performance. Wallis suggested that 'patient-avoiding behaviors' were a possible staff strategy for coping with stress that might have negative consequences for the quality of patient care[60]. Arnetz and Arnetz's[3] (Figure 1) built on Wallis' model and focused on violence towards staff as a specific source of stress. Violence is illustrated as ellipses with the common center being the interaction between staff and patient. The immediate environment affects this interaction. The feedback loop suggests that negative aspects

of the environment may also contribute to the development of violent behavior in patients. The model argues that violence from patients has a negative effect on care staff, causing more negative attitudes toward work tasks and the patients. This negative climate affects the patient–staff relationship, with the caregiver on his/her guard, spending less time with patients, and less responsive to patients' needs. Thus, violence has a negative effect on the ward environment, and eventually on the quality of care[3].

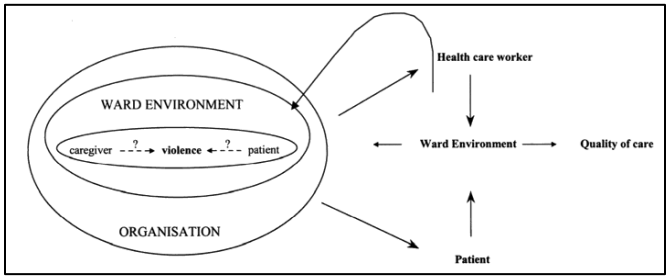

Figure 1. Arnetz and Arnetz's 2001 Model[3]

This model (Figure 1) guided my hypothesis that resident aggression experienced by care aides is negatively associated with quality of care. Similar to Arnetz and Arnetz's model[3], I argued that resident aggression has a negative effect on care staff, causing more negative attitudes toward work tasks and the residents and thus creates a negative climate affecting the resident – staff relationship. It puts the care aide on his/her guard, potentially spending less time with residents, and potentially being less responsive to their needs. Thus resident aggression is viewed as a negative unit characteristic eventually negatively affecting quality of care.

Quality of care is a complex concept [13, 47,48,24, 28]. I used the clinical microsystem literature to guide my selection of variables that predict quality of care at the unit level. Units, described as microsystems, are argued to be the place where care is made – where quality, safety, reliability, efficiency and innovation are made and where staff morale and patient satisfaction are made[55]. A clinical microsystem is "a small group of people who work together on a regular basis to provide care to discrete subpopulations of patients" (p.474)[44]. They share aims, processes, information and outcomes. Studies from a variety of organizations including nursing homes[31,43,61] have demonstrated that when these systems are identified and supported they can improve quality. Research on 20 highly-performing clinical microsystems has identified a set of nine shared characteristics that contribute to a successful clinical microsystem:

leadership; culture; organizational support; patient focus; staff focus; interdependence of care team; information and information technology; process improvement; and performance patterns[44]. High performing microsystems are by definition systems that enable quality care; therefore, predictors of high performing microsystems can also be reasoned to predict good quality of care. Seven of the nine characteristics of high performing clinical microsystems[44] were incorporated into my research model by closely comparing concept definitions of the clinical microsystem characteristics with those available in the data to which I had access.

Methods

Project #1: Resident aggression and quality of care in long-term care: A critical literature review

The method used was a critical review of the literature. I systematically searched and reviewed the literature in two searches (see Appendix 1): one for studies on resident aggression and quality of care to validate a gap in the literature; one for reviews and primary studies on resident aggression involving care staff to gain a comprehensive overview of previous research. I conducted an extensive search of several electronic databases using numerous synonyms of the keywords. I also conducted ancestry searches and searches of key authors. Extensive screening sought to determine current literature themes and empirical research evidence. Using specific inclusion criteria, I screened articles by title and abstract for further reading. Only articles that met inclusion criteria were included.

Project #2: Resident aggression and quality of care in long-term care

The method used to explore the effect of resident aggression towards care staff on quality of care was statistical modeling using multiple regression and data from the *Translating Research In Elder Care* (TREC) program[16] with the permission of the principle investigator, Dr. Carole Estabrooks. My research model (Figure 2) was created using Arnetz and Arnetz's model[3] and variable selection was guided by the clinical microsystems literature. The existing data set included a sample of nursing home care aides (from the TREC survey) and residents (from the Resident Assessment Instrument –Minimum Data Set 2.0 (RAI-MDS) also collected in TREC) aggregated to 103 units from 36 LTC facilities across Alberta, Saskatchewan, and Manitoba. The final analytical sample I used had 100 units. Three units were excluded because they only had

one respondent from each unit. Individual level data were collected from care aides working in participating LTC facilities using the TREC survey. Care aides were recruited using volunteer, census sampling. The survey was administered by trained data collectors using computer-assisted personal interviews[16, 52]. A total of 1497 care aides' individual data were aggregated to the 100 units. Individual resident data were transferred to TREC from the RAI-MDS 2.0, which were routinely collected from all residents in nursing homes in the RAI-MDS 2.0 database and participating in TREC. The resident sample consisted of 4220 residents in a cross-sectional sample that matched the survey data collection. These individual resident records were aggregated to the unit level in order to obtain the QIs. The QIs were computed by Dr. Jeff Poss, a consultant to the TREC research team. I worked closely with Dr. Poss to understand how RAI QIs are derived and how risk adjustment is performed.

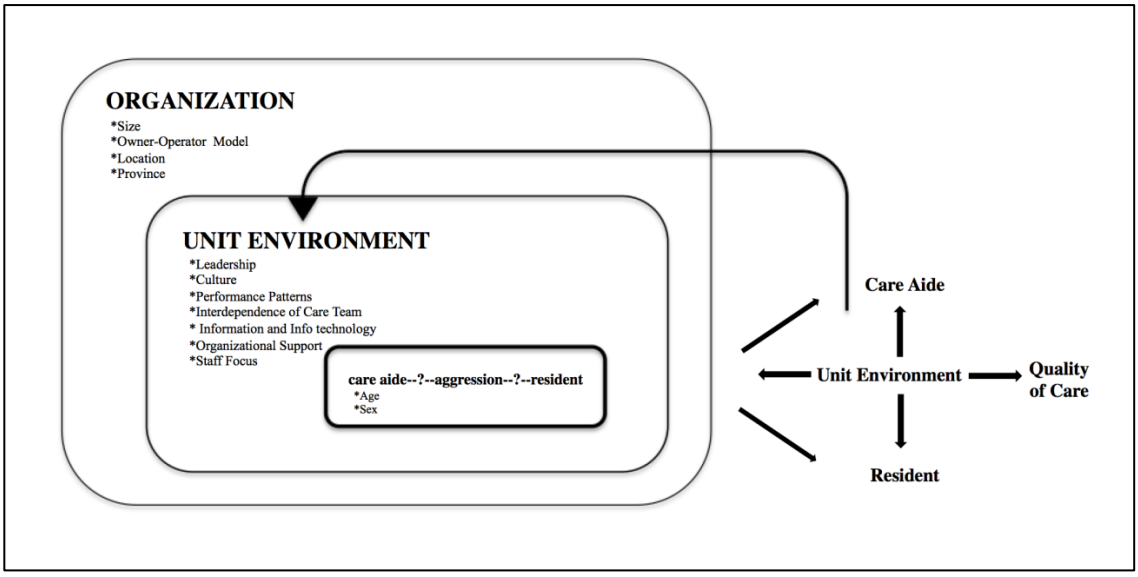

Figure 2. Research Model (Note: Adapted from Arnetz & Arnetz 2001 Model)

Results

Project #1: Resident aggression and quality of care in long-term care: A critical literature review

I examined 240 titles and abstracts using the following inclusion criteria: (a) the article reported on the relationship between resident aggression against staff and quality of care (QIs, resident outcomes); (b) the sample contained all or some care aides working in residential LTC settings for older adults; (c) it was a primary research study. This led to retrieval of only one article[30],

hence a second broader search was completed. From the second search I examined 383 titles and abstracts using inclusion criteria: (a) must have been a primary research study OR any type of review other than opinion-based; (b) the sample contained all or some care aides working in residential LTC settings for older adults; (c) the purpose involved the general topic of resident aggression directed at care staff; (c) the article reported on resident aggression toward care staff. From this group, I extracted data from 61 articles and 11 reviews that formed the final group of included studies. Of these articles, 37 were quantitative, 21 were qualitative and three were mixed methods. Findings were grouped into categories: care aides' experience of resident aggression, predictors of resident aggression, educational and other interventions aimed to reduce resident aggression, and incidence and prevalence of resident aggression.

Findings: The relationship between resident aggression and quality of care in LTC is not well studied. I located only one study that linked quality of care in LTC and resident aggression. The second broadened search on resident aggression and care staff in LTC identified 11 reviews and 61 articles. These results expand current literature by providing a comprehensive overview of the state of knowledge in this area. The topics identified in the literature are necessary and important investments; however, I identified that further research is needed on care staff, the residents and their care. Much of the research focused on effects of resident aggression on care aides instead of on the residents. I identified a gap in the literature with respect to the effect of resident aggression on resident care.

This paper will be authored by Carleton, Estabrooks, Slaughter and Schopflocher and the target journal is the *International Journal of Nursing Studies*.

Project #2: Resident aggression and quality of care in long-term care

I explored the relationship of resident aggression to quality of care using multiple regression in several models guided by Arnetz and Arnetz's 2001 theoretical model[3], the clinical microsystems literature and findings from the literature review. I hypothesized that units with more resident aggression would display worse resident quality of care. Variables controlled for in the models were unit size, location, owner operator model; care aide age, sex, job satisfaction, burn out; and unit organizational context. Outcome variables utilized were the RAI-MDS QIs of decline in activities of daily living, pressure ulcers, worsening pain and restraint use. I ran four

separate regressions using each of the different QIs as the outcome variable and compared the results.

Findings: My findings were mixed. Resident aggression was significantly associated with a lower percent of pressure ulcers and was not significantly related to declining resident ADLs, worsening resident pain or restraint use. Owner operator model and location of the unit were the most consistent statistically significant predictors of quality of care. The amount of variance explained in the final models ranged from 26.4% to 35%. This study demonstrated how little is known about resident aggression and that more research is required to further investigate the relationship between resident aggression and quality of care to enable us to reach more definitive conclusions. Second, the findings raised questions about the measure of resident aggression and revealed the need for a standardized measurement tool. Third, the owner operator model and location of the unit were, in these models, important predictors of quality of care providing support to existing claims in the literature.

This second paper, authored by Carleton, Estabrooks, Slaughter and Schopflocher is being submitted for review to *BMC Geriatrics.*

Contributions To Theory, Research, Nursing Knowledge, Nursing Practice

Theory

This thesis contributed to theory by demonstrating the value and utility of working with two theoretical positions. I applied Arnetz and Arnetz's theoretical model[3] and the microsystems literature together to guide my research study. Together these theories were important in guiding my hypothesis, the construction of models and my interpretation of the findings. I did find meaningful results with a relatively small sample size supporting evaluation of quality of care at the microsystem level[17]. However, the microsystems theory is more developed having been validated in many settings and populations. Arnetz and Arnetz's model has only been tested in a hospital setting. I assessed it in the LTC setting but my findings were inconsistent with the theory; thus, not supporting the framework in this instance. This raises the possibility that it may not work as well in other settings.

Research

Through the literature review I provided a comprehensive overview of the state of knowledge and research in the area. I also identified a gap in the literature, provided insight into how little we know about resident aggression and its possible effect on quality of care. The review highlights areas for future study.

In my empirical study I addressed a gap in the literature. This is the first study of which I am aware to investigate the effect of care aide experienced resident aggression on resident quality of care in LTC. My evaluation of resident aggression towards care aides and quality of care added to the limited literature on this topic; however, it also highlighted areas for future work to be done.

Methodologically, this thesis illustrates the potential in combining data sets to study a relationship in regression models. Even with a small sample size I still found meaningful results demonstrating the utility of secondary analysis and data set linkage. These meaningful results and the relatively large variance explained by the models also showed support for the use of aggregated unit level data, consistent with the literature[17]. The finding that two resident aggression measures were only slightly correlated highlighted an area for future research and additional methodological work to be done in measuring resident aggression.

Nursing Knowledge

My findings contribute to nursing knowledge in the following ways. First, I have contributed knowledge to what is known about resident aggression in relation to quality of care. Second, I have added to the theoretical position of Arnetz and Arnetz that quality of care is affected by violence as a unit characteristic in LTC. Third, I have validated the study and evaluation of quality of care at the unit level as a clinical microsystem. This study supports the clinical microsystem as a target area for the development and assessment of interventions aimed to improve care for the older adult population in LTC.

More and somewhat different research is needed to expand practice implications. A stronger observational design could better study the direct effects of resident aggression on quality of

care. Examples of elements that would strengthen such a design are a larger sample size, random selection or recruitment of participants and blinding to reduce observer bias.

Nursing Practice

While my findings do not contribute as directly to nursing practice as some studies, I have laid groundwork for the development and assessment of interventions aimed to modify resident aggression and/or quality of care at the unit level. Studies with experimental designs would assist us to understand the effectiveness of interventions designed to improve resident aggression and/or quality of care at the unit level.

Future Research

A review of definitions in the literature of resident aggression and responsive behaviours would help clarify and better define resident aggression. In regards to the measure of aggression, a systematic review and critique of the existing tools that measure resident aggression would benefit further work utilizing these measures. Additionally, there is a need for further work to develop a more robust measure of resident aggression.

Resident aggression in the older adult LTC population has increasing importance with the emphasis on quality of care in LTC. Understanding how quality of care is affected by high rates of aggression on a care unit will help us develop evidence-informed interventions to help mediate change and is an area for further inquiry and development.

Limitations

The primary limitation of the empirical study is the retrospective nature limiting control over the data, sample size, the variables available and any inferences of causality. Regression techniques represent a hypothesis where underlying causal mechanisms cannot be assumed and only relationships can be ascertained. My sample size (n=100) was not optimal for the number of variables (14) in the models. Additionally, both rural and urban facilities were used in the analysis; however, the rural facilities (included to maintain as large a sample size as possible, were not the primary sample in TREC, were collected with a different sampling technique and post hoc assessments have confirmed differences in the facilities[17]. With the analysis conducted at the unit level I will have lost some variance in the models.

"Matching" the TREC and RAI data sets for analysis required some loss of precision. The TREC survey data were collected over a year in a quarterly schedule with approximately one quarter of the 36 sites having data collected each quarter. RAI assessments are done quarterly and the CIHI third generation risk adjustment for QIs uses a four quarter rolling average (in the assessment denominator) to perform the calculations. For example, a QI for the October to December quarter would include assessments for that quarter, plus the prior three quarters. QIs are computed using the number of assessments as the denominator. The rolling average mitigates the potential for small sample size issues in the denominator, particularly when QIs are computed at the unit level. However, it reduces the precision with which a quarter of RAI data can be matched to a quarter of survey data. The rolling average included not only the quarter in which the TREC survey was conducted but also the two prior quarters to the TREC survey and one quarter after the survey.

The TREC data were self-report survey data, which have inherent limitations of relying on the honesty and understanding of participants and the risk for recall bias, social desirability bias and response bias.

Conclusion

This thesis research identifies the gap between what is known about resident aggression and quality of care and what is needed for future study. Future research that studies resident aggression towards care aides with different QIs or different quality measures would potentially provide more insight into the effects of resident aggression on quality of care. Also, research to develop the report and measurement of resident aggression would aid in the accurate detection and monitoring of resident aggression required for its study.

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CHAPTER 2

Resident aggression and quality of care in long-term care

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Background

It is well known that older adults account for an ever-increasing proportion of the population. With aging, the prevalence of dementia increases and simultaneously the need for long-term care (LTC) increases. In Canada it is estimated that five hundred thousand persons have dementia and within a generation this number is expected to more than double[2]. Characterized by a gradual progressive decline in cognitive and functional status of those affected, dementia has been declared a public health concern by the World Health Organization[89]. It is the most significant cause of disability among older Canadians[2] and has been demonstrated as a key factor to nursing home institutionalization[84, 85]. With its progressive nature and without cure, prevalence and incidence of dementia will continue to increase[89], increasing the need for LTC[2].

With the aging population, quality of care in LTC will continue to be increasingly important[68]. The state of care in LTC has been described as suboptimal at the international[70], national[65] and provincial[17, 35] levels. Care aides, who are an unregulated work group in Canada, provide the majority of direct care to older adults in LTC facilities[51]. Care aides currently have the least amount of education and training among health care workers in nursing homes[14]. At the same time, older adults presenting to LTC are increasingly older, with more advanced stages of dementias and/or chronic diseases and are requiring complex care[25, 36].

Dementia, requiring some of the most complex care, is the most common diagnosis in LTC[12, 36]. Dementia involves a collection of symptoms that significantly interferes with one's daily functioning and relationships, negatively influencing one's quality of life. Both the loss of cognitive capacity (i.e., executive function, memory, reasoning, communication) and non-cognitive features of dementia such as behavioral and psychological symptoms (i.e., wandering, agitation, shouting, hording and inappropriate language) – often affect people with dementia[86].

These symptoms are demanding and create significant challenges for caregivers[1]. Aggressive behavior (such as verbal threats, hitting, spitting and biting) are some of the most challenging behavioral symptoms that caregivers face[28, 57] and are a well recorded phenomenon in LTC[72, 90]. However, their magnitude is thought to be significantly underestimated with the majority of events going underreported[7, 10, 30, 32, 60].

Aggression is commonly elicited as one type of 'responsive behavior', the term "originating from, and preferred by, persons with dementia that represents how their actions, words and gestures are a response, often intentional, to something important to them"[64]. For example, situations of personal care have been associated with high incidences of aggression suggesting residents may misinterpret such care for personal violation or intrusion of personal space[15, 48, 78]. In this paper we use the terms 'resident aggression' and 'aggression'.

Causes of aggression in older adults are multifaceted and not fully understood[11, 48]. Clinical issues of resident pain, dehydration, hunger, urinary, chest and dental infections have been reported as frequent triggers[11, 15]. Further, it has been associated with care provider characteristics[29, 61] and organizational conditions[44, 78]. Whatever the cause, high rates of resident aggression can adversely affect care staff and the residents.

Consequences for care aides include psychological trauma[76], burnout[26, 27, 32, 55], job dissatisfaction[52], distress and job strain[61] and physical injuries[5, 31, 32, 81]. Resident consequences involve possible diminished quality of care[57] by adversely affecting staff-resident relationships and triggering negative care aide responses[5, 30, 54, 57, 62, 77] such as avoidance and use of physical and pharmacological restraints[62, 69]. Negative care aide responses to residents may also lead to perpetuation of resident aggression and to responses of being aggressive or abusive themselves[29]. Further, both physical and pharmaceutical restraint continue to be used to manage aggression in LTC despite major policy shifts[19] and adverse effects. The use of psychotropic medications carry serious risks, for example, over sedation, confusion and agitation, increased risk of falls and even death[6, 18].

Up to now, relatively little research has explored the relationship between resident aggression and quality of care. Only one study[49] was located that noted the possible effects of

resident aggression on quality of care. Others have explored incidence and prevalence of resident aggression, predictors of resident aggression, care aides' experience of resident aggression, and educational interventions aimed to reduce resident aggression. Much of the research has focused on the effects of resident aggression on care aides instead of the effects on residents. Although these are necessary and important investments, vulnerable residents and their care are a pressing matter. With the aging population and focus on quality in LTC, there is urgency to investigate the effect on quality of care.

To our knowledge no study has focused on the effects of resident aggression on quality of care in LTC using resident quality indicators (QIs) derived from the RAI-MDS 2.0. Our aim was to investigate the relationship between resident aggression experienced by care aides and quality of care in LTC operationalized as selected unit level RAI-MDS 2.0 QIs.

Theoretical Framing

Following Arnetz and Arnetz's theoretical model of hospital violence[4], we hypothesize that resident aggression can be considered a unit characteristic that adversely affects quality of care. The clinical microsystem literature was utilized to guide selection of variables that predict quality of care at the unit level. Units, described as microsystems, are argued to be the place where care is made; quality, safety, reliability, efficiency and innovation are made; and staff morale and patient satisfaction are made[82]. A clinical microsystem is "a small group of people who work together on a regular basis to provide care to discrete subpopulations of patients" (p.474)[67], which shares aims, processes, information and outcomes. Studies from a variety of organizations including nursing homes[66,87,50] have demonstrated that when these systems are identified and supported they can improve the quality. High performing microsystems are by definition systems that enable quality care; therefore, predictors of high performing microsystems also predict good quality of care.

Method

Design

We conducted a secondary analysis of unit level data from 36 LTC facilities in the longitudinal observational *Translating Research in Elder Care* (TREC) study[21]. After

aggregating individual care aide responses to the unit level and calculating unit level QIs we constructed regression models to explore the relationship between care aide experienced resident aggression and quality of care while controlling for individual and organizational characteristics known to affect unit level quality of care from previous studies (see Figure 2).

Insert Figure 2-Research model about here

The original TREC study and the current research project were approved and received research ethics approval from the University of Alberta Health Research Ethics Board.

Sampling and Data Sources

Facility sample- facility and unit survey data

All nursing homes across Alberta, Saskatchewan and Manitoba that met the inclusion criteria were eligible to participate. Urban nursing home (n=30) selection was stratified (by healthcare region, owner operational model, and size) and used random sampling. The rural sample (n=6) was a convenience sample[21]. Unit and facility data were collected from unit managers and administrators July 16, 2009 to June 30, 2010 using the unit and facility surveys developed by TREC.

Care aide sample- care aide data

Care aides were recruited using volunteer, census sampling. All care aides working in the participating LTC facilities were invited to participate and were included if they met the inclusion criteria of (a) having worked for at least three months and were presently working; (b) having worked a minimum of six shifts per month on the unit. Students were excluded. Care aide data were collected from care aides in participating LTC facilities using the TREC survey July 16, 2009 to June 30, 2010. The survey was administered by trained data collectors using computer-assisted personal interviews[21, 80]. These individual responses to the TREC survey were then aggregated to the unit level as previously reported[23].

Resident sample – resident data

Resident level data were obtained from the Resident Assessment Instrument – Minimum Data Set 2.0 (RAI-MDS 2.0) database. All facilities in TREC used the RAI-MDS 2.0 assessment

as part of regular clinical practice, with residents assessed on admission, discharge, quarterly (with a shorter version of the instrument), and when significant clinical change occurred. The TREC team obtained the RAI data from appropriate provincial or regional data custodians. RAI data corresponding to the time period in which the survey was administered on a unit were aggregated to the unit level and risk adjusted QIs were computed.

QIs have been developed and tested to reflect quality of care processes and outcomes[37, 75], and provide a basis for quality improvement in LTC settings[3, 47]. QIs are calculated according to the presence or absence of a particular indicator for a resident. These data are then aggregated for all residents in a unit to provide a unit estimate for the occurrence of the QI[40]. Some indicators, such as percent of residents with pressure ulcers, are computed according to prevalence (i.e., number of existing occurrences), while others, such as worsening pain, are calculated according to incidence (i.e., number of new occurrences)[41]. RAI assessments are done quarterly and the CIHI third generation risk adjustment for QIs uses a four quarter rolling average (in the assessment denominator) to perform the calculations. QIs are computed using the number of assessments that quarter as the denominator. Risk adjusted QIs were used to facilitate comparisons[46] among units as they enable accounting for differences in the risk profiles of resident populations within individual facilities or units[13, 46].

Sample

Our final sample was 100 units from 36 LTC facilities in Alberta, Saskatchewan and Manitoba. Three units were excluded because there was only one respondent from each unit. A total of 1497 care aides' responses were aggregated to the unit level (n=100) using methods previously reported by the TREC team[23]. A cross-sectional sample of 4220 resident assessments that matched the survey data collection were aggregated to the unit level (n=100) to compute the QIs.

Measures

Dependent Variable – Quality of Care

The RAI-MDS 2.0 Instrument

Quality of care is defined for the purposes of this project as "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (p. 21)[43]. Determining quality of care from assessment information that is routinely collected for nursing home residents has been shown to differentiate between high and poor quality of care nursing homes[74].

Four risk adjusted unit level QIs (percent of pressure ulcers, a decline in activities of daily living (ADL) function (e.g., toilet use), worsening pain, and physical restraint use) from the RAI-MDS 2.0 instrument were used as dependent variables representing quality of care. These four QIs have been identified as sensitive to nursing care[22] and are a sub-set of thirteen 'practice sensitive' QIs recently identified[22]. The RAI-MDS 2.0 instrument is widely used in over 30 countries around the world[37]. Extensive work has gone into establishing its reliability and validity[34, 37-39, 71, 88].

Independent Variables

TREC Survey

All independent variables were taken from the TREC survey completed by the care aides. The TREC survey measures organizational context, use of best practices, and staff outcomes[21]. It includes measures such as resident aggression and job satisfaction, and also includes the Alberta Context Tool (ACT), a 51-item instrument that measures eight dimensions (10 concepts) of organizational context: leadership, culture, evaluation, formal interactions, informal interactions, social capital, structural resources, and organizational slack[20, 21]. The ACT was adapted for and piloted in the LTC setting[80]; its psychometric properties have been reported elsewhere[20, 21, 24].

Control Variables

Care aide characteristics (age and sex) and unit characteristics (size[73], owner-operator model[33], province and rural vs. urban[25]) from the TREC care aide and facility survey, respectively, were used as control variables.

The nine characteristics of high performing clinical microsystems[67] guided the selection of additional control variables. They were selected by closely comparing concept definitions of the clinical microsystem characteristics with the available TREC concepts. The variables used

from the TREC survey best reflecting clinical microsystems were the 10 ACT concepts, care aide job satisfaction and care aide burnout. Each concept has been previously defined and operationalized by the TREC team[20] (See Table 1).

Insert Table 1-Control variables selected for multiple regressions about here

Aggression Measures

For the independent variable of interest, resident aggression, two different measures of aggression were used; one from the TREC survey and one from the RAI-MDS 2.0 data. Two measures were used because they were both available and were fundamentally different tools; thus, thought to represent resident aggression better together than alone. Aggression toward staff from residents from the TREC survey (TREC Aggression) was assessed from six items (yelling or screaming, verbal threats, hurtful remarks or behaviors, being spit on, bitten, hit, pushed, or pinched, repeated and unwanted questions or remarks of a sexual nature, sexual touching) and yes/no responses to each item, The item scores (0 or 1) were totaled for a score that could range from 0 to 6. Aggression toward staff from residents from the RAI-MDS 2.0 data (RAI Aggression) was measured using the Aggressive Behaviour Scale scored 0-12 over the last seven days from 5 items (comatose; verbally abusive behavior: frequency; physically abusive behavior: frequency; socially inappropriate/disruptive behavior: frequency; resists care: frequency).

Analyses

All data analyses were conducted using SPSS Version 21.0[42].

Individual care aide and resident characteristics were described using means and standard deviations for interval data and frequency counts and proportions for categorical data. Frequency distributions of each of the variables were examined for normality. Multiple regression analysis was applied to study the association between resident aggression and quality outcomes.

We conducted separate multiple regression analyses for each dependent variable (loss of ADLs, worsening pain, percent of pressure ulcers, restraint use) with resident aggression as the primary independent variable. Five models were conducted in each regression series with the same set of independent variables for each QI. In the first model we assessed the relationship between

resident aggression and the outcome measure of focus, in the second we controlled for the block of independent variables reflective of unit characteristics (size, owner-operator model, rural vs. urban), in the third and fourth we controlled for care aide characteristics (age, sex, job satisfaction then burnout) and in the fifth model ACT factors (i.e., work environment) were controlled for. In order to include categorical variables, dummy variables were created for the ownership and location variables.

Multicollinearity was investigated using the variance inflation factor and Pearson product-moment correlations. Preliminary regression analysis and collinearity diagnostics revealed that collinearity was a concern across the province variables and the 10 ACT variables. In a first attempt to resolve these problems separate regressions were run excluding one of the variables within each group of collinear variables and repeated until diagnostics indicated no remaining collinearity. Then, the models in which the greatest amount of variance in the dependent variable was explained were examined. Unfortunately while this process eliminated collinearity among the province variables; it lead to elimination of many ACT variables making interpretation difficult.

As an alternate strategy to reduce collinearity we used factor analysis to reduce the ACT variables from 10 variables to two uncorrelated components that accounted for substantial amounts of the variability among the ACT variables, and then re-ran the regressions using the factor scores as independent variables.

Though the two measures of aggression were correlated, both were included in the final models. In order to further investigate the effect of aggression on quality of care, factor analysis was used to reorient the two measures so that one factor reflected what aggression measure in common by virtue of their association, and a second factor represented what the two measures did not have in common (i.e., the differences between them). The regressions were re-run with these factors in the place of the two aggression measures.

Among the four QIs, only the outcome measures of resident worsening pain and ADLs were correlated. Therefore we expected the models for these two dependent variables to be similar. As restraint use and resident pressure ulcers were independent measures of quality of care, we

expected that the models for these measures might be considerably different from the other models.

Results

General Characteristics of the Units

Of the 100 units included in the study, 53 (53%) were located in Alberta, 21 (21%) in Saskatchewan and 26 (26%) in Manitoba, Ninety-two (92%) were in urban areas and eight (8%) in rural areas. Thirty-two (32%) of the units were within publicly owned and operated facilities, 19% were within private and 49% were within voluntary (see Table 2). The number of care aide respondent scores that were aggregated to create unit scores ranged from 5 to 26. Characteristics of the care aide and of the residents are depicted in Table 2. Additional unit characteristics are depicted in Table 3.

Insert Table 2-Description of sample about here

Insert Table 3-Unit characteristics about here

Factor Analysis

The factor analysis of the ACT variables (Table 4) was done to reduce collinearity. It suggested that most of the variability among units can be captured if these 10 variables are replaced by just two factors. The first factor shows that the majority of variables related to organizational context or work environment (leadership, culture, evaluation, structural and electronic resources, organizational staff, space and time) are highly inter-correlated within this sample, while the second factor represents the social environment by showing a strong relationship to the amount of informal interactions and moderate relationships to formal interactions and social capital.

Insert Table 4-Factor analysis of ACT variables to reduce collinearity about here

The two measures of aggression were correlated (r= .348); however when entered in the regression models together, they explained more of variance in the models than when entered separately; thus factor analysis was run on the two measures in attempt to obtain one factor that reflected only the aggression measured in both measures. The factor analysis of the resident

aggression measures resulted in one factor that reflected common measures of aggression by virtue of their association, and a second factor represented what the two measures did not have in common (i.e., the differences between them) (Table 5).

Insert Table 5-*Factor analysis of resident aggression measures about here*

Results of Regression Analysis of Resident Aggression and Resident Quality of Care

All the final regression models were significant (see Table 6). The analysis showed that resident aggression did not have a significant effect on two of the resident outcome measures: declining resident function in ADLs and worsening resident pain. The final analysis predicting pressure ulcers (R^2= .275, p<.05) showed a significant inverse relationship between resident aggression and pressure ulcers. The more resident aggression there was on a unit, the lower the percentage of residents with stage 2 to 4 pressure ulcers (beta= -.282, p<.05). In predicting restraint use (R^2= .264, p<.05), more resident aggression associated with more restraint use (beta=.238, p=. 54) although this did not meet our priori p<.05 level.

We re-ran the regression models with the factors from the factor analysis in the place of the two aggression measures (Table 6). The results showed that factor one, which represented the correlated measures of resident aggression, was inversely related at a statistically significant level to pressure ulcers (R^2= .275, beta = -.202, p=.046). No statistically significant association was found with either factor and restraint use.

The Quality Models

We ran a total of four analyses, one for each of the dependent variables (ADL decline, worsening pain, pressure ulcer percent and restraint use). The results of these analyses are presented in Table 6. In each analysis we ran a total of five models. We describe the analysis of these five models in full for one outcome variable (pressure ulcer percent) and then report only final differences among the other four.

Insert Table 6-Standardized coefficients (beta) of regression models for resident QIs about here

Predicting Resident Percent of Pressure Ulcers

In Model I, aggression factor one did influence the percent of pressure ulcers at a statistically significant level. With increasing resident aggression there was a lower percent of pressure ulcers. The explanatory power of the model (R^2=.073) was relatively high. In Model II, we conducted another regression analysis, adding unit characteristics to the resident aggression variables. None of the unit characteristics were demonstrated to be statistically significant and aggression was no longer significant. In Model III we added unit care aide characteristics of age, sex and job satisfaction where only care aide sex was significant to pressure ulcers. In Model IV we added unit care aide burnout (Maslach Burnout Inventory[56]) and only efficacy (a sub-scale on the Maslach Burnout Inventory) influenced pressure ulcers with statistical significance. Both, a higher proportion of female care aides on a unit and greater efficacy among care aides on a unit were associated with a higher percent of pressure ulcers. Additionally, after adding care aide characteristics, resident aggression became statistically significant in both models. The explanatory power of Model IV was .268, increased from 0.172 in Model III, and increased from .094 in Model II. Finally, in Model V we added the organizational context variables and the explanatory power increased again to 0.275. Organizational context variables were not related at statistically significantly levels to percent of pressure ulcers. After adding the organizational context factors in Model V, care aide sex, care aide efficacy and resident aggression remained statistically significant predictors of pressure ulcers. The betas remained relatively stable through out the models.

Final Differences Among Quality of Care Models

Ownership was associated with residents' decline in ADLs, worsening pain and restraint use at statistically significant levels. Voluntary ownership was associated with better pain management while public ownership was associated with a decline in ADLs and private ownership with more restraint use. Rural units were associated with better ADL scores and pain management but more restraint use. Care aide efficacy was associated with better scores in resident ADLs but was not associated with the remaining QIs. The organizational context variable informal interactions and to an extent the context variables formal interactions and social capital, were positively associated with a decline in resident ADLs. Organizational context variables were not associated with the other remaining QIs (Table 6).

Discussion

This is the first study of which we are aware that investigates the effects of resident aggression experienced by care aides on quality of care in an integrative model. Finding meaningful results through unit level modeling supports the evaluation of quality of the care unit at the microsystems level.

Our study results only partially support our theoretical model and hypothesis. According to our theoretical model, resident aggression is a negative unit characteristic eventually negatively affecting quality of care. No statistically significant relationships were found between resident aggression and the quality outcomes of worsening resident ADLs, worsening resident pain or restraint use. We hypothesized that quality of care measured using these QIs would be compromised on units with high levels of resident aggression. Additionally, qualitative research[30, 45, 52, 53, 57, 76] indicated that care aides who experienced aggression from residents treated those residents differently, often avoiding them, isolating them or not answering their call bells. It was assumed that this would lead to poorer resident outcomes. However, in this study the statistical results suggest that residents demonstrating higher levels of responsive behaviors may receive the same care as other residents.

Resident aggression was related to percent of resident pressure ulcers after controlling for unit, care aide and organizational context variables but in the opposite direction of that hypothesized. We had hypothesized that units with high rates of resident aggression experienced by care aides would have higher rates of pressure ulcers. In a national study[8] on pressure ulcers and predictors of healing in LTC, receiving rehabilitation services was associated with healing while immobility was associated with not healing. Residents in LTC that are well enough and strong enough to display responsive behaviors may also be more likely to be mobile, physically active residents thus reducing their chances of developing pressure ulcers or increasing their chances of a pressure ulcer healing. Percent of resident pressure ulcers may not be the best QI to predict the effects of high levels of resident aggression on a unit. More research is indicated to investigate this relationship.

We found that the two aggression measures (RAI and TREC aggression) were slightly correlated but explained more variance in the models when both were entered in the models

together. We knew the measures were different (i.e., TREC aggression captured 0-6 acts of aggression experienced in the last five shifts through an interview of care aides where RAI aggression captured aggression over seven days scored 0-12 by individuals entering data into a computer system) but we expected them to be highly correlated and have a similar effect on quality of care. This was not the case. Using factor analysis we showed that the measures had overlapping components measuring aggression; however they were both measuring additional factors not in common with one another. These results suggest that further work is required in defining aggression, operationalizing aggression and creating a standardized tool to measure it. This finding is in accordance with current literature. A systematic review[90] reported that prevalence and incidence of resident aggression varies immensely because it is measured with different tools and reported over different frequencies and time periods. Additionally, aggression is not always captured and rates are thought to be seriously underestimated – with 60 to 80% of incidences not reported[7, 10, 30, 32, 60].

Consistent with the previous research[9, 16], owner-operator model was a significant predictor of our operationalization of quality of care. Voluntary (e.g., faith based) not for profit ownership was associated with better scores on resident ADLs and pain management while private for profit ownership units had more restraint use. This is similar to a systematic review and meta-analysis that found not-for-profit nursing homes deliver higher quality care on average than do for-profit nursing homes[16].

Geographic location was a statistically significant predictor of three of the four quality outcomes. Rural units scored better on resident ADLs and pain management but had more restraint use than urban units. Rural facilities are likely smaller and have less access to specialized personnel and continuing education programs[63] possibly explaining the increased restraint use with less continuing education and less staff to supervise residents. Because rural units are smaller they may have regular staff who are familiar with the residents and thus, better at recognizing the residents' pain resulting in more ability to mobilize.

Care aide characteristics were generally not statistically significant in the models; however, sex and the Maslach Burnout Inventory sub-scale, efficacy were statistically significant as predictors of the percent of pressure ulcers. Both a larger proportion of female care aides on a

unit and the higher job efficacy reported by care aides on a unit resulted in a higher unit percent of pressure ulcers. With the majority of the care aide work force female[79] it may be possible that females better report pressure ulcers. It is concerning high efficacy was associated with more pressure ulcers because it is viewed as a positive concept to prevent burnout[56]. However, this is the only study to our knowledge to find an association of care aide sex and efficacy to pressure ulcers; thus, additional research is required to investigate this further.

Conclusion

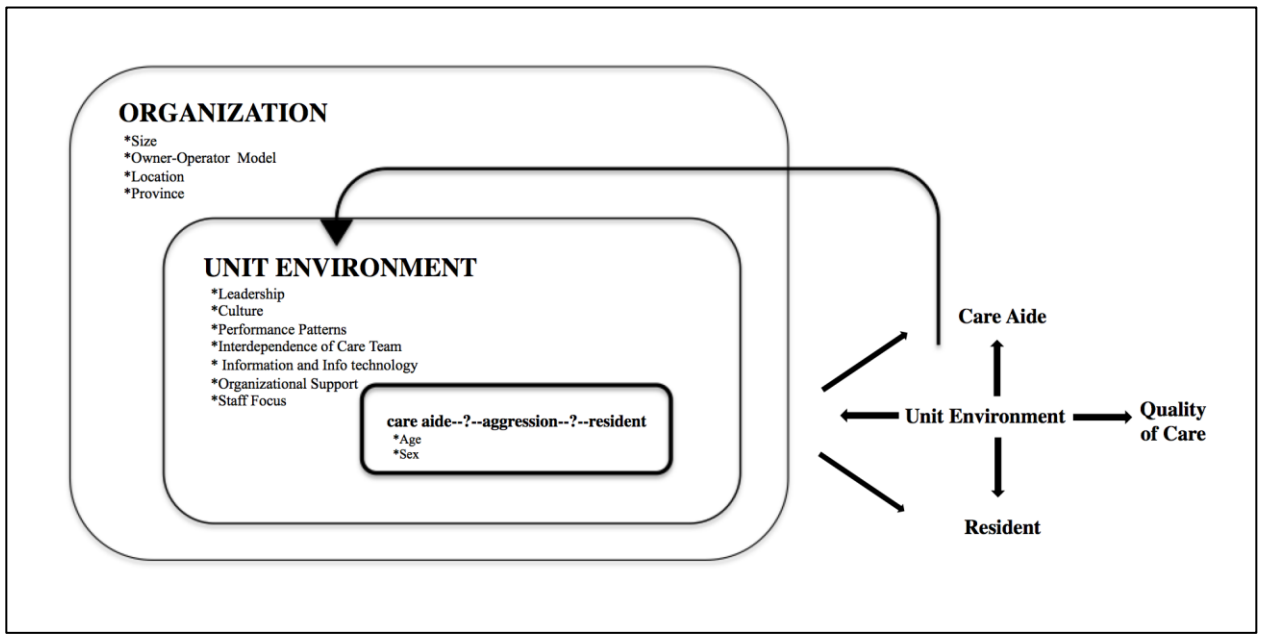
This evaluation of resident aggression towards care aides and quality of care adds to the limited literature in the area. The results showed that resident aggression is associated with quality of care but not in ways that we anticipated. Further research is required. First, the results of this study raise some question as to whether resident aggression negatively affected quality of care or if the QIs used were the most sensitive QIs to resident aggression in LTC. The four QIs used were among those identified as most sensitive to nursing care[22] and were feasible for this project; however, quality of care is a multidimensional, complex concept.[83] We had available to us simpler measures of quality of care that may have been inadequate. Additionally, the RAI QIs have been criticized as not being sufficiently sensitive indicators of quality[58, 59]. Thus, additional studies and investigating resident aggression towards care aides with different QIs or different quality measures may provide more insight into the effects of resident aggression on quality of care. Second, the study results emphasize the need for the development of a standardized tool to measure and report resident aggression. Further, to more accurately report resident aggression work into defining resident aggression and responsive behavior[64] would be beneficial. Third, this study confirms that there are differences in quality of care among different owner-operated models and location of the facility highlighting areas for quality improvement initiatives. Understanding how resident aggression affects quality of care will help us to develop evidence-informed interventions to help mediate change and is an area for further inquiry and development.

Limitations

The sample size (n=100) was not optimal for the number of variables (14) in the models, but we were restricted to a sample size that equalled the number of units in order to maintain a unit level analysis of quality – which was our study aim. Additionally, both rural and urban

facilities were used in the analysis; however, the rural sample was collected with a different sampling technique and post hoc assessments have confirmed differences in the facilities[23]. The care aide data are self-report survey data, which have inherent limitations of the risk for recall bias, social desirability bias and response bias. Third, as in all regression techniques, the model is only a hypothesis where underlying causal mechanisms cannot be assumed and only relationships can be ascertained.

Figure 2. Research model



Note: Adapted from Arnetz & Arnetz 2001 Model

Table 1. Control variables selected for multiple regressions

Concept	Definition	Operationalization
Unit Characteristics		
Unit Size	Total number of residents in a unit.	An overall value for total beds number is derived by summing the number of LTC beds and non-LTC beds in each unit
Location	Rural or urban location.	Rural sites were greater than 100 km (but less than 200 km) radius of Regina or Saskatoon, and with populations of 10,000 people or less; Urban facilities had to be within designated health regions (i.e., Alberta – Edmonton, Calgary, or East Central; Manitoba – Winnipeg; Saskatchewan – Regina-Qu'Appelle or Saskatoon).
Ownership	Owner-operator model.	Private (for profit) is a facility in which the individual(s) or agency in control receives compensation other than wages, rent, or other expenses for the services they provide; Public is a facility supported primarily through public funds, owned and operated by the local government; Voluntary is a facility that is run by voluntary, cultural or religious organizations.
Care Aide Characteristics		
Care Aide Age	Age range in years old.	Twelve categories to choose from: < 20 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49 years, 50-54 years, 55-59 years, 60-64 years, 65-70 years, > 70 years.
Car Aide Sex	Care aide sex.	Male or female.
Job Satisfaction	An individual's perception of whether they are "satisfied" in their current job (e.g., satisfied being a health care aide in LTC).	1 item scored on a 5 point Likert Scale: 1-strongly disagree to 5- strongly agree
Maslach Burnout Inventory (MBI) Exhaustion, Cynicism, Efficacy	A debilitating psychological condition brought about by unrelieved work stress.	Exhaustion: 3 items scored on a 7-point Likert frequency scale 0-never to 6-daily.
		Cynicism: 3 items scored on a 7-point Likert frequency scale 0-never to 6-daily.
		Efficacy: 3 items scored on a 7-point Likert frequency scale 0-never to 6-daily; A subscale score is derived by taking the sum of the 3 items-burnout is reflected in higher scores on exhaustion and cynicism, and lower scores on efficacy.
ACT Concepts		
Leadership	The actions of formal leaders in an organization (unit) to influence change and excellence in practice, items generally reflect emotionally intelligent leadership.	Six items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree
Culture	The way that 'we do things' in our organizations and work units; items generally reflect a supportive work culture.	Six items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree
Evaluation	The process of using data to assess group/team performance and to achieve outcomes in organizations or units.	Six items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree
Formal Interactions	Formal exchanges that occur	Four items scored on a 5-point Likert agreement scale

Concept	Definition	Operationalization
	between individuals working within an organization (unit) through scheduled activities that can promote the transfer of knowledge.	as follows: 1-strongly disagree to 5-strongly agree
Informal Interactions	Informal exchanges that occur between individuals working within an organization (unit) that can promote the transfer of knowledge.	Nine items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree
Social Capital	The stock of active connections among people. These connections are of three types: bonding, bridging, and linking.	Six items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree
Structural/Electronic Resources	The structural and electronic elements of an organization (unit) that facilitate the ability to assess and use knowledge	Eleven items scored on a 5-point Likert frequency scale (plus not available option) as follows: 1-never, to 5-almost always, 6-not available
Organizational Slack - Staff, Time, Space	The cushion of actual or potential resources which allows an organization (unit) to adapt successfully to internal or external pressures for changes.	Staff - Three items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree Time - Four items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree Space- Three items scored on a 5-point Likert agreement scale as follows: 1-strongly disagree to 5-strongly agree

Table 2. Description of samples

Unit Sample *n=100*, n (%)		
Owner-Operator Model	Public	32 (32)
	Private	19 (19)
	Voluntary	49 (49)
Unit Size	Small (35-79 beds)	22 (22)
	Medium (80-100 beds)	26 (26)
	Large (>120 beds)	52 (52)
Province	Alberta	53 (53)
	Saskatchewan	21 (21)
	Manitoba	26 (26)
Location	Urban	92 (92)
	Rural	8 (8)
Care Aide Sample *n=1497*, n (%)		
Age, in years, n (%)	<20 years	12 (.8)
	20–24 years	71 (4.7)
	25- 29 years	107 (7.1)
	30–34 years	143 (9.6)
	35-39 years	173 (11.6)
	40-44 years	234 (15.6)
	45-49 years	233 (15.6)
	50- 54 years	233(15.6)
	55- 59 years	170(11.4)
	60-64 years	99(6.6)
	65-70 years	20(1.3)
	>70 years	1(0.1)
Sex	Male	104 (6.9)
	Female	1391 (92.9)
Education Level	High School	1380 (92.2)
	Care Aide Certificate	1253 (83.7)
	Diploma or Degree	644 (43.0)
First Language English		824 (55.0)
Born in Canada		668 (44.6)
Resident Sample *n= ~4220*, mean percent (range)		
Age in years	<65	4.211 (0-27.6)
	65-74	7.858 (0-45.0)
	75-94	29.654 (9.6-55.0)
	85-94	47.241 (9.3-78.4)
	>95	11.036 (0-29.3)
Gender	Female	67.375 (0-90.1)
Diagnoses	Alzheimer's/Dementia	62.273 (12.4-100)
	Stroke	19.496 (0-46.8)
	Diabetes	19.450 (3.8-35.7)
	Depression	30.452 (4.6-64.5)
	ADL 4+	44.783 (2.8-83.7)
	CPS 3+	68.836 (27-100)

Table 3. Unit characteristics- descriptive statistics on aggregated context variables and aggregated care aide variables

Unit Sample *n=100,* mean (range)	
Context Variables	
Leadership	3.87 (2.40- 4.35)
Culture	3.94 (3.41- 4.50)
Evaluation	3.49 (2.62- 4.11)
Formal Interactions	1.31 (0.73- 2.00)
Informal Interactions	4.15 (2.68- 5.45)
Structural & Electronic Resources	4.02 (0.65- 6.10)
OS- Staff	2.91 (1.17- 4.50)
OS - Space	2.70 (1.67- 4.42)
OS - Time	3.29 (2.30- 4.29)
Care Aide Variables	
MBI Exhaustion	2.47 (0.95- 3.78)
MBI Cynicism	2.17 (0.97- 3.61)
MBI Efficacy	5.19 (4.22- 5.89)
Job Satisfaction	4.07 (3.25- 4.63)

Table 4. Factor analysis of ACT variables to reduce collinearity

ACT Factor	1	2
ACT Variables		
Leadership	**.673**	-.183
Culture	**.852**	-.095
Evaluation	**.717**	-.017
Formal Interactions	.634	**.422**
Informal Interactions	.246	**.900**
Social Capital	.635	**.391**
Structural/Electronic Resources	**.587**	-.093
OS Staff	**.855**	-.267
OS Space	**.573**	-.294
OS Time	**.890**	-.078

Table 5. Factor analysis of resident aggression measures

Aggression Factor	1	2
TREC Aggression	.821	-.571
RAI Aggression	.821	.571

Table 6. Standardized coefficients (beta) of regression models for resident QIs

Variables	Decline in ADLs					Worsening Pain					Pressure Ulcers					Restraint Use				
	I	II	III	IV	V	I	II	III	IV	V	I	II	III	IV	V	I	II	III	IV	V
Aggression Factor 1	.192	.159	.145	.177	.118	-.053	-.096	-.102	-.101	-.161	**-.207***	-.188	**-.148***	**-.204***	**-.202***	.036	.042	.086	.095	.101
Aggression Factor 2	.040	-.065	-.059	-.126	-.120	-.146	-.032	-.024	-.039	-.036	.170	-.102	-.186	-.191	-.181	-.160	-.093	-.153	-.192	-.201
Unit Size		.013	.006	.080	.054		-.141	-.141	-.129	-.154		.046	.069	.013	.012		-.174	-.141	-.122	-.119
Rural~		-.202	**-.253***	**-.278***	**-.269***		**-.389***	**-.407***	**-.412***	**-.395***		.133	.137	.150	.122		**.353***	**.412***	**.401***	**.425***
Private O-O+		**-.407***	**-.416***	**-.382***	**-.381***		-.219	-.226	-.221	-.220		.110	.119	.116	.115		**.388***	**.398***	**.426***	**.426***
Voluntary O-O+		**-.379***	**-.376***	**-.359***	**-.339***		**-.335***	**-.333***	**-.332***	**-.309***		.160	.178	.160	.151		.169	.180	.189	.195
Care Aide Age			-.023	-.048	-.101			-.042	-.044	-.101			-.147	-.126	-.110			-.162	-.176	-.183
Care Aide Sex			.190	.160	.147			.067	.064	.054			**.244***	**.268***	**.257***			-.027	-.042	-.030
Job Satisfaction			-.053	-.065	-.135			-.044	-.071	-.156			.198	.066	.120			.153	.177	.137
MBI Exhaustion				-.163	-.146				-.061	-.037				-.006	-.032				.041	.063
MBI Cynicism				-.129	-.178				-.016	-.075				-.015	.022				-.138	-.165
MBI Efficacy				-.178	**-.254***				.007	-.080				**.339***	**.376***				-.089	-.113
ACT Factor 1					.233					.267					-.125					.083
ACT Factor 2					**.219***					.212					.031					-.055
R^2	.038	**.172**	**.214**	**.270**	**.350**	.024	**.168***	**.178***	.181	**.269***	**.072***	.094	**.172***	**.268***	**.275***	.027	**.209***	**.245***	**.260***	**.264***
R^2 Adjusted	.019	**.119**	**.135**	**.169**	**.243**	.004	**.115***	**.095***	.069	**.149***	**.052***	.036	**.089***	**.167***	**.156***	.007	**.158***	**.170***	**.158***	**.143***

*: $p<0.05$
~: Reference Urban
+: Reference Public
O-O: Owner-Operator

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APPENDIX 1

Resident Aggression in Long-term Care: A Critical Literature Review

This appendix will be developed into a paper for the International Journal of Nursing Studies.
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What is already known about this topic?

- Resident aggression towards care staff is prevalent in LTC.
- Resident aggression experienced by care staff has adverse effects on those staff.

What this paper adds:

- This review shines a light on a gap in the literature linking quality of care in LTC and resident aggression.
- Provides an overview of the current literature on the topic of resident aggression experienced by care staff in LTC.

1. Background

The world's population is ageing. By 2050, two billion people are estimated to be over the age of 60[90]. Given that the greatest risk factor for dementia is advanced age[3], for many countries there will be a rising number of people with dementia. The prevalence of dementia doubles with every five-year increment in age after 65[93]. The number of people globally with dementia in 2011 was estimated to be 35.6 million, and epidemiological studies indicate that this number is expected to grow at an expedited rate. It is estimated that numbers will nearly double every 20 years, to 65.7 million in 2030 and 115.4 million in 2050[93]. With the total number of new cases each year worldwide 7.7 million thus nearly one new case every four seconds, dementia is a major public health concern[93]. With its progressive nature and without cure, prevalence and incidence of dementia will continue to increase, particularly among the oldest old, and countries in demographic transition[93].

With this aging population and increased prevalence of dementia, the global profile of dependence is increasing[4]. Dementia is a syndrome, of a chronic or progressive nature, caused by a variety of brain illnesses affecting memory, thinking, behavior and ability to perform daily

activities. It is the leading cause of dependency (i.e., need for care) and disability among older persons in high-, middle- and low-income countries[4, 93]. In high income countries, dementia is the most important contributor to transition into residential and nursing home care[4]. A recent report[4] on LTC reported that around half of all people with dementia need personal care and the others will develop such needs over time. Care in care homes was reported as and remaining an important component of the LTC system for people with dementia with around one-third to one-half of people with dementia in high-income countries, and around 6% of those in low- and middle-income countries currently cared for in nursing homes. Demographic, social and economic trends are predicted to increase demand for high quality formal care services in care homes[4].

Care aides, unregulated, non-professional personal care workers, provide the majority of direct care to older adults in Canada's LTC facilities[48]. Personal care workers' job content and responsibilities are similar worldwide; however, their titles vary: health care aides/ nurse assistant/ personal support worker (Canada), ancillary workers (Australia), care assistants (Austria), social and health care assistants (Denmark), elderly carer (Germany), home helper (Japan), and auxiliary nurse (Sweden)[65]. Care aides currently have the least amount of education and training of health care workers in nursing homes[19]. Lacking qualification and certification of care aides in LTC has been reported as a quality concern internationally[65]. Yet, older people presenting to LTC are increasingly older, with more advanced stages of dementia and/or chronic disease states and thus are more dependent requiring complex care[38].

Dementia is the among the most common diagnosis in LTC[18, 38]. Dementia involves a collection of symptoms that significantly interferes with one's daily functioning and relationships, negatively influencing one's quality of life. Both the loss of cognitive capacity (i.e., executive function, memory, reasoning, communication) and non-cognitive features of dementia such as behavioral and psychological symptoms (i.e., wandering, agitation, shouting, hording and inappropriate language) – often affect people with dementia[10,89]. These behavioral features are demanding and challenging for caregivers[2]. Some of the most challenging behavioral manifestations that care staff face are aggressive behaviors.[30, 59] Aggression, such as acts of verbal threats, hitting, spitting, biting and pinching, is commonly elicited as one type of 'responsive or expressive behavior', which is a term "originating from, and preferred by, persons with dementia that represents how their actions, words and gestures are a response, often intentional, to something important to them"[20, 63]. For example, situations of personal care have

been associated with high incidences of aggression suggesting residents may misinterpret such care for personal violation or intrusion of personal space[23, 45, 79]. Resident aggression has also been associated with care provider characteristics[32, 61], quality of the interactions between staff and residents[20] and organizational conditions[42, 79]. Further, frequent triggers of aggressive behaviour are of clinical origin in unmet physiological (e.g., pain, dehydration, infection), psychological and social needs[16, 20, 23]. Conversely, resident characteristics such as cognitive impairment and especially dementia have been linked with resident-to-staff aggression[69, 92]. Overall, causes of aggression in older adults are multifaceted and not fully understood[16, 45]. To encompass all aggressive behaviour elicited for various reasons, the terms 'resident aggression' and 'aggression' are used in this paper. 'Aggression' and 'aggressive behavior' have been cited in a review[69] as the almost universal terms in dementia care literature; however, it is important to note that it is most accurately known as one type of 'responsive' or 'expressive behavior'[20, 63].

Aggressive behavior, with more severe forms manifesting in the middle to late stages of dementia[21, 68, 87], is a well-recorded phenomenon in LTC[69, 96]. One systematic review of resident aggression in LTC reported a large variance in prevalence and incident rates but did report rates as high as 1.2 incidents per day[96]. Rates are however thought to be seriously underestimated – with 60 to 80% of incidences not reported[13, 15, 33, 36, 60]. High rates of resident aggression directed at care staff have consequences for both the care staff and the residents.

Consequences for care aides include emotional distress, psychological problems, and physical injuries. Managing aggression has been reported as the most difficult aspect of a care aide's job[30, 59] and most care aides feel they cannot control, change or modify the situation[35, 59, 62]. Experiencing resident aggression has been associated with care aide psychological trauma and fear for personal safety[75], burnout[27, 28, 36, 56], job dissatisfaction[49], distress and job strain[61]. Additionally, there have been several reports of care aide injuries resulting from resident aggression with a significant proportion serious enough to require medical attention[7, 35, 36, 88].

Consequences for residents involve suspected diminished quality of care by adversely affecting staff-resident relationships and triggering negative care aide responses such as avoidance and use of physical and pharmacological restraints. Resident aggression has led to care aides feeling fear, anger, frustration, and resentment and responding negatively by withdrawing, distancing, avoiding, and even changing the way they cared and treated those residents[7, 33, 55, 59, 62, 76]. Qualitative studies of care aides' experience of aggression reported negative consequences for residents that included the reluctance of staff to spend time with them

or answer their call lights, ignoring requests for assistance, and delays in attending to the residents' needs[33, 53, 62]. Care aides, in one study, perceived the care they delivered to aggressive residents as lower quality[59]. The presence of resident aggression has been reported as one of the main factors associated with increased number of quality deficiencies in a Norwegian nursing home[46]. Negative care aide responses to residents may also lead to perpetuation of resident aggression and to responses of being aggressive or abusive themselves further negatively impacting quality of care[32].

Restraint and medication use have been described as additional responses to aggressive behavior[62, 66]. Both physical and pharmaceutical restraint have a long history in management of aggression in patients with cognitive impairment and they continue to be used in LTC despite major policy shifts from restraint use[26] and despite their adverse effects. The use of psychotropic medications for example, not only carry risks of serious adverse effects, but can also lead to over sedation of residents, perpetuation of aggression, confusion and agitation and increased risk of falls[8, 25, 47].

The aim of this review is to identify literature that links resident aggression experienced by care staff to care quality in LTC and to gain a comprehensive overview of current literature on resident aggression toward care staff in LTC.

3. Method – Critical Literature Review

3.1 Search One: Resident Aggression and Quality of Care

In consultation with a librarian, the electronic databases Medline (PubMed), CINAHL, PsychINFO, SocINDEX, and Scopus were searched using search strings of synonyms of the keywords 'resident aggression', 'care aides', 'LTC' and 'quality of care' (see Figure 3 for search strategy). The search was limited to peer-reviewed articles with abstracts in English and published from the earliest date available in each database to June 2013. A study was eligible for inclusion if (a) the article reported on the relationship between resident aggression against staff and quality of care (quality indicators, resident outcomes); (b) the sample contained all or some care aides working in residential LTC settings for older adults; (c) it was a primary research study.

A total of 399 articles were located in Medline (n = 84 studies), CINAHL (n = 57 studies), PsycINFO (n = 112 studies), SocINDEX (n = 31 studies) and Scopus (n = 115 studies).

After duplicated articles (n=159) were removed, 240 titles and abstracts were screened for relevance to resident aggression directed to care aides and quality of care. A total of 239 articles were further exempted after reviewing the abstracts because they were not relevant, did not take place in residential LTC for older adults, focused on resident aggression without context of the care aides or care quality, included samples of other caregivers (e.g., family or registered nurses), or were non-research based articles. This lead to retrieval of only one article[46], hence a second broadened search was completed to assess the scope of literature in the area.

3.2 Search Two: Resident Aggression in LTC

We completed electronic searches were conducted, in consultation with a librarian, for peer-reviewed English language primary research studies and reviews published from the earliest date available to June 2013 in the databases Medline, CINAHL, PsychINFO, SocINDEX, Scopus, Cochrane Library and the Annual Review of Nursing Research using search strings of numerous synonyms of the keywords 'resident aggression', 'care aides' and 'LTC' (see Figure 4 for search strategy). Additionally, references in relevant journal articles (ancestry searching) and articles by experts in the field (author searching) were searched. Inclusion criteria included: (a) must be a primary research study OR any type of review other than opinion-based; (b) the sample contained at least some care aides; (c) the setting was residential LTC for older adults; (d) the purpose involved resident aggression directed at care staff; (e) the article reported on resident aggression toward care staff.

We located 541 articles in Medline (n = 66 studies), CINAHL (n = 96 studies), PsycINFO (n = 84 studies), SocINDEX (n = 21 studies), Scopus (n = 269 studies), Cochrane (n = 3 studies) and Annual Review of Nursing Research (n = 2 studies). We removed duplicate articles (n=158) and the remaining 383 articles' titles and abstracts were screened for relevance to the general topic of resident aggression experienced by care aides in LTC. We excluded 274 articles at the title and abstract stage; full manuscripts of 21 reviews and 88 original studies were obtained and reviewed. We excluded an additional 42 publications (n=10 reviews and n=32 studies) after full manuscript review. Reasons for exclusion included: (1) set outside of LTC for older adults; (2) samples consisting of solely professional staff; (3) research results that could not clearly assign aggressive acts by residents to care aides (e.g., research about elder abuse and neglect); (4) studies reporting resident aggression only (no care aide involvement); (5) those that had a specific focus on one type of aggressive behavior such as vocally abusive behavior or

behavior during bathing; (6) not research based. An additional 5 articles were added after searching secondary references of relevant articles. We retained 61 articles and 11 reviews.

One researcher (HC) independently extracted data from each eligible paper. Information about the study setting, research design, sample characteristics, and data collection methods were extracted for data synthesis (see Table 7 for study characteristics). Major findings from the studies were compared with one another for similarities and differences.

4. Results

4.1 Reviews

Eleven reviews on resident aggression in LTC were included; five systematic reviews[26, 64, 85, 91, 96], three critical reviews[51, 76, 86] and three narrative/selective reviews[2, 12, 69]. These reviews were focused on the general topic of resident aggression towards care aides in LTC; none addressed the possible effects of resident aggression on quality of care. The majority (82%) of the reviews[2, 26, 51, 64, 69, 85, 86, 91, 96] focused on the management or medical treatment of resident aggression. Other foci included incidence or prevalence of aggression[69, 96], implications of resident aggression on care staff[69, 76] and causes of aggression[14, 69]. Six[2, 14, 64, 85, 86, 91] (54%) of the reviews concentrated on behavioural and psychological symptoms of dementia, meaning their attention was directed to articles grouping aggressive behaviour with other symptoms of dementia (e.g., wandering, hoarding). Only five (45%) reviews concentrated exclusively on resident aggressive behaviour: three[26, 51, 69] on management of resident aggression, one[96] on the prevalence of resident aggression, and one[76] on perceptions and implications for staff of resident aggressive behavior. None of these reviews investigated articles that sought to explore possible effects of resident aggression on quality of care.

4.2 Original Research Studies

This search yielded 61 appropriate original research studies. Thirty-seven studies used quantitative methods, 21 studies qualitative methods and three used mixed methods. Most studies were conducted in the United States (n=25), followed by Sweden (n=16) and Canada (n=7). The remaining studies were conducted in 10 different countries: Switzerland (n=2), Denmark (n=2), Korea (n=2), Netherlands (n=1), Norway (n=1), Ireland (n=1), Japan (n=1), Australia (n=1), New Zealand (n=1), Turkey (n=1). Only 24 articles had samples containing only care aides; 28

had care aides mixed with other levels of staff such as RNs, enrolled nurses and authors of 9 articles reported only 'care staff' or 'caregiver'. The sample sizes ranged from 1 to 3092 participants but three never reported a sample size. The studies were placed into categories; however, some reported on more than one topic and appear in more than one category. The topics were: prevalence and incidence of resident aggression (n=26), predictors of resident aggression (n=16), interventions to reduce resident aggression (n=13) and care staffs' experiences of resident aggression (n=32).

4.2.1 Incidence and Prevalence of Aggression toward Care Staff

Twenty-six cross-sectional studies reported on the frequency, incidence, prevalence or the report of resident aggression toward care staff. Eight studies[6, 11, 50, 56, 66, 74, 77, 84] reported on the incidence or prevalence of resident aggression toward care aides in LTC while 18[7, 12, 13, 15, 22, 30-32, 34-36, 44, 62, 67, 75, 78, 88, 94] only reported on a measure of aggression present in their sample as descriptive information. Incidence rates/ prevalence of resident aggression experienced by care aides varied immensely and were difficult to compare. Incidence was measured with different tools and reported over different frequencies and time periods. For example, one study[11] reported that 90% of Canadian frontline workers (n=415) reported experiencing violence at work with 43% experiencing it daily while another[84] reported 4833 incidents occurring in US nursing homes over two weeks with 77.3% of the sample (n=76) experiencing aggression. Another study[56] reported 56% of care staff experienced aggression at work and two of the studies[6, 77] compared incidence and prevalence, respectively, of aggression across settings. These studies[6, 77] reported highest incidence[6] (in Sweden; n=265) and prevalence[77] (in Denmark; n=3092) of aggression towards care staff in nursing homes compared to other settings. While these five studies[6, 11, 56, 77, 84] above measured aggressive events against care aides, the remaining three studies[50, 66, 74] reported aggression displayed by residents making comparison of these rates even more difficult. Resident aggression was reported as: 15.6% of residents (n=1552) directed aggression at care aides over two weeks[50]; 62.9% of residents (n=205) were found to be aggressive through a questionnaire[66]; 45.4% of the resident sample (n=391) manifested aggression over 2 weeks[74]. Overall, there was a significant amount of resident aggression towards care aides in LTC reported in the literature.

In addition to reporting incidence/ prevalence, five studies[13, 15, 36, 77, 84] addressed the topic of formally reporting resident aggression and six[7, 31, 35, 36, 56, 88] reported information on injuries

resulting from resident aggression. Events of resident aggression were generally underreported by care aides in the findings of these studies: 41 (0.27%) incidents of an estimated 15000 incidents over 6 months were formally submitted by care aides (n=126)[36]; 4.6% of incidents were reported to the facility by care aides (n=76)[84]; 22% of care aides (n=3092) reported an event to the safety organization[77]; 29% of incidents were documented by care aides (n not reported)[13]; 79% of incidents were reported by care aides (n=91) to LPNs[15]. Frequency and seriousness of injuries to care aides from resident aggression varied: 34% of care aides (n=2888) surveyed reported experiencing physical injuries from residents' aggression in the previous year[88]; 38.1% of participants (n=848) reported injuries and two of the participants consulted a doctor[7]; 51% care aides (n=138) stated that they had been injured in their lifetime and 38% of those received medical attention for an injury[35]; 60-90% of care aides (n=20) across two nursing homes experienced injury at some point while working[31]; 6% of care staff (n=214) consulted a doctor from an injury[56]; and two-thirds of care aide (n=126) injuries warranted medical attention[36].

4.2.2 Care Staff Predictors of Resident Aggression

Sixteen cross-sectional studies reported care staff predictors of resident aggression. Sample sizes ranged from a low of 32 participants[42] to 3092 participants[78]. Fourteen authors reported on individual factors and nine reported on organizational factors.

4.2.2.1 Individual Factors

Individual predictors of resident aggression addressed were age (9 studies), years of experience (10 studies), gender (7 studies), education (10 studies), English as a first language (1 study), health status (9 studies), personal factors (5 studies) and work status (7 studies).

Demographics

Of the nine studies that addressed age, four (44%) studies (n=506[6]; n=551[28]; n=138[35]; n=214[56]) carried out only a bivariate or t-test between a group who experienced aggression and group who had not. Majority (75%) found increasing age was significantly related to less incidences of assault. Four (44%) authors looked at regression analysis of age and resident aggression. Three (60%) studies (n=138[32]; n=3092[78]; n=804[94]) found significant results for younger care staff experiencing more aggression while two (40%) studies (n=40[44]; n=355[61])

found non-significant results but both trended toward significance with the same association. Overall, increasing age of the care staff appears to be associated with less incidents of resident aggression. Ten studies addressed 11 variables of years of experience where four were only bivariate associations and seven were regression analysis. Majority (75%) of the lower level analyses studies (n=551[28]; n=214[56]; n=83[62]) reported that there was no relationship. In the higher-level models, the majority (86%) of authors (n=91[15]; n=355[61]; n=138[32]; n=32[41]; n=32[41]; n=40[44]; n=3092[78]) found no relationship between years of experience and resident aggression. The types of regression analyses in which authors reported non-significant results were multiple, discriminant analysis, and logistic, while the multinomial regression study found less experience was associated with more resident aggression.

Seven authors addressed sex of the care staff in association with resident aggression; one as a frequency (n=506[6]), four (n=91[15]; n=40[44]; n=3092[78]; n=[56]) with bivariate or chi-squared analysis and two (n=355[61]; n=804[94]) with regression analysis. None of the authors found a significant association between gender of staff and residents' aggressive behaviours.

Education level was assessed in ten studies (measured 13 different ways). Just over half (54%) of the studies reported a frequency, used bivariate analysis or a difference in means test between a group who experienced violence and group who had not and half (46%) used regression analysis. All five lower level analyses (n=91[15]; n=33[41]; n=40[44]; n=214[56]; n=214[56]) resulted in non-significant results suggesting no association between resident aggression and education level. The regression analysis resulted in four (67%; n=138[32], n=91[15], n=355[61], n=355[61]) non-significant and two (33%; n=3092[78], n=804[94]) significant results, more research is needed to determine whether there is an association between care staff education and resident aggression.

English as a first language was only reviewed in one study (n=91[15]) in a bivariate analysis with resident aggression and was found to be non-significant.

Health Status

Nine authors examined several variables of care staff health status in relation to resident aggression. Two studies[32, 61] looked at five variables of strain (vocational strain, job strain, physical strain, stress of role insufficiency, and stress of role ambiguity). Using a t-test between care staff who experienced resident aggression and those who had not in two of the variables (vocational strain and physical strain (n=138[32])), in both cases they found that the group that

experienced resident aggression had higher strain. The remaining three variables of strain (job strain (n=355[61]), role insufficiency (n=138[32]), role ambiguity (n=138[32])) were looked at with regression analysis, found to be significant and reported as positively related to number of resident incidents of resident aggression.

Five authors addressed eight measures of burnout; four were measured using lower level analysis (e.g., correlation, difference in means between group exposed to aggression and group who had not) and four were measured using regression analysis. The lower of analyses (n=126[36]; n=91[15]; n=91[15]; n=214[56]) yielded non-significant results suggesting no relationship between burnout and resident aggression. The four measures that looked at regression analyses yielded two (n=551[28]; n=551[28]) (50%) significant results of burnout related to resident aggression and two (n=91[15]; n=40[44]) (50%) showing no significant association. These finding suggest that relationship between burnout and resident aggression is unlikely; however, four different burnout instruments were used (Staff Burnout Scale for Health Professionals[36], Maslach Burnout Inventory[15, 28], Pines–Aronson Burnout scale[56], and Tedium scale[44]) and multiple items from one scale were reported as a measure of burnout and may provide reason for equivocal findings.

Three authors (n=91[15]; n=33[41]; n=76[84]) looked at eight different measures of job satisfaction. Majority (87.5%) of the measures were only examined with bivariate (n=91[15]; n=91[15]) and Man-Whitney U-test analyses (n=33[41]; n=33[41]; n=33[41]). Four (57%) of the analyses (job satisfaction[15], career satisfaction[15], job satisfaction- emotion[41], job satisfaction-control[41]) were not significant finding no relationship and three (43%) (job satisfaction- initiative[41], job satisfaction-relation[41], job satisfaction- nature of work[84]) were significant finding an association between job satisfaction and resident aggression. Only one used regression analysis, a discriminant analysis (job satisfaction-competence, n=32[41]), and found job satisfaction as a significant discriminating factor between units who had high proportions of violence and units who had low proportions of violence. More research is required to make any conclusions about job satisfaction and resident aggression associations.

One author (n=76[84]) assessed turnover intentions and satisfaction with organizational commitment in relation to resident aggression experienced by staff using only bivariate analyses. Significant positive associations were found between resident aggression and both turnover intentions and satisfaction with commitment. More research is needed involving turnover intentions and commitment and resident aggression.

Character Traits

Six authors[32, 35, 44, 56, 61, 94] looked at eleven different character traits of care providers and the association to resident aggression: anger trait, anger state, temperament, defence style, character aspects, status, physical coping ability, self efficacy, self knowledge, confidence, and preparedness. State anger and anger trait were positively related to the number of incidents of aggression in regression analysis (n=138[32]) while there was no association with temperament, defence style, and character aspects and aggression in Chi-square analysis (n=40[44]) between caregivers who were exposed to aggression and those who were not. Similarly, no association was found with status and aggression in a Mann Whitney U-test (n=214[56]) between caregivers who were exposed to aggression and those who were not. There was a significantly reduced risk of experiencing resident aggression with increased care provider preparedness and confidence in regression analyses (n=804[94]). In bivariate analysis (n=138[35]), caregivers' self-rated knowledge was positively associated with increased incidence of aggression while self-efficacy showed no association. In a logistic regression analysis (n=355[61]) caregivers' coping ability was not associated with frequency of aggression. Generally, no variables were examined in more than one study; thus, more research is needed into character traits and incidence aggression to make any valid conclusions.

Work Status

Seven authors[6, 15, 28, 44, 56, 61, 78] addressed eight variables of care staff work status. Majority (75%) of the variables were assessed with lower level analyses with half (50%) (n=91[15]; n=40[44]; n=214[56]) finding no association and half (50%) (n=506[6]; n=506[6]; n=551[28]) finding a significant association. Only two regression analyses (n=3092[78]; n=355[61]) were carried out and both were significant where shift work and having a permanent position increased odds of experiencing resident aggression.

4.2.2.2 Organizational Factors

Fifty-two organizational factors were addressed by nine authors. The various organizational variables assessed in relation to incidence of resident aggression were: setting (2), physical facility characteristics (5), type of facility/unit (6), workload (6), resources/support (9), and environment/culture characteristics (24). Compared to other settings in health care, working in LTC was reported as a significant increased risk for care providers to experience increased

frequency of resident aggression in a chi-squared (n=506[6]) and multinomial regression analyses (n=3092[78]). No physical facility characteristics (e.g., space, facility size, total area, length of corridor) were associated with frequency of aggression in bivariate or regression analyses. There was minimal evidence to suggest special care facilities or facilities with a special care unit were associated with increased incidents of aggression as two (67%) (n=33[41]; n=77[58]) of three studies (n=83[62]) that used bivariate analyses were significant and only one (33%) (n=91[15]) of the three studies (n=355[61]; n=804[94]) that used regression analyses was significant. Workload was positively associated with frequency of resident aggression in one (100%) (perceived difficulty, n=33[41]) bivariate analysis and four (80%) (number of residents, n=138[32]; caregiver to resident ratio, n=32[41]; psychological load, n=32[41]; physical load, n=3092[78]) of five regression analyses (physical workload, n=32[41]). No associations were reported between resources (nine variables among two authors (n=91[15]; n=804[94])) and resident aggression in bivariate or regression analyses. Of the 24 workplace culture and environment variables investigated among 3 authors[15, 41, 78], the majority (71%) were not associated with resident aggression and less than half (42%) of the variables were assessed in regression models. Further, most of the variables under workplace culture and environment were assessed in only one study. Overall, only workload as an organizational variable may be associated with resident aggression while the other variables require further investigation.

4.2.2.3 Other

One study (n=40[44]) reported on other predictors of resident aggression: maternal rejection factor, mother emotional warmth. Maternal rejection factor and mother emotional warmth were studied in a discriminant analysis. Maternal rejection factor was found to be the strongest discriminating factor between two groups of caregivers where one had been exposed to aggression and one had not.

4.2.2.4 Quality of Care

In a multivariate regression, increased quality deficiencies in a Norwegian nursing home (n=1926[46]) were associated with increased resident aggression by staff. Although several authors[32, 42, 58, 61, 95] discussed the potential role of resident aggression affecting quality of care, only one study[46] attempted to examine this empirically. The emotional toll that occurred to caregivers when they faced resident aggression on a daily basis was reported as certain to have

an impact on the quality of care provided to residents[42]. Additionally staff perceptions of resident aggression were stated to affect interpretation of resident behaviours thus quality of care that they received from the staff[58]. It was raised that care aides are in need of tools to be able to manage caring for older adults with dementia as care aides are in a position to have a profound influence on the quality of care residents receive[61]. Additionally, care aides' decision making was thought to impact their risk of exposure to aggression and quality of care for residents[94]. From the perspective of the effect on work culture, aggression against caregivers was thought to contribute to a negative work environment, which was expected to impact residents' care[32].

4.2.3 Interventions to Reduce Resident Aggression Towards Care Aides

Interventions to reduce resident aggression were reported in 13 studies. Eleven[9, 17, 22, 29, 31, 34, 39, 40, 57, 67, 71] of these studies reported on staff education/training interventions and two[52, 83] on other interventions (i.e., tactile stimulation, group therapy). The interventions investigated were heterogeneous in content, purpose, length, method and outcome measures. Six[22, 29, 31, 34, 57, 67] studies were quasi-experimental designs, three[17, 39, 40] were randomized controlled treatments, two[52, 83] were interventional designs with qualitative analysis, one was observational[71] and one[9] was an experimental case study. Sample sizes ranged from a low of one participant[9] to a high of 158 participants[39]. To test the outcome of the intervention, ten of the studies[9, 17, 22, 31, 34, 40, 52, 57, 67, 71] assessed the rate of aggression toward care staff or incidence of aggression and only five[9, 17, 31, 52, 57] reported improvement. Three[17, 31, 52] found a significant reduction in aggressive behaviours, while the other two[9, 57] found reductions in the count of incidents of aggression with no statistical analysis. Of the interventions that were found to have a significant difference, one[52] was a group therapy session focused on wellness and the other two[17, 31] were behavioural education training programs. The two[9, 57] interventions that reported decreased count of aggressive incidents were also behavioural management training programs. The remaining five studies that found non-significant changes in rates of aggression were educational interventions for staff with various topics: emotional response training[22]; social cognitive theory training[34]; progressively lowered stress threshold model training[67]; online behavioural training[40]; behavioural management and communication training[71]. Some of these interventional studies reported on more than one outcome measure. Eleven studies[17, 22, 29, 31, 34, 39, 40, 52, 57, 67, 83] assessed some measure of staff self-reported outcomes to assess the effectiveness of the intervention. These self-rated staff outcome measures were: knowledge, self efficacy, attitude toward residents, perception of residents,

empathy, and behaviour management skills. Staff knowledge was assessed in six[29, 31, 34, 39, 40, 57] studies, which reported that staff knowledge significantly increased after an educational intervention in five[31, 34, 39, 40, 57] of the six studies. Four[31, 34, 39, 40] studies assessed staff self efficacy or confidence as an outcome measure while three[31, 34, 39] of these reported a significant increase in self-reported self efficacy or confidence after an educational intervention. Staff attitude toward residents was assessed in three studies[22, 39, 40] and significantly changed for the better in one study[39] post-educational intervention but did not change in two studies[22, 40] post-educational intervention. Perception of residents was investigated in three studies[29, 57, 83] as an outcome measure of an intervention but post-intervention one[29] reported no changes while two[57, 83] reported an "improvement" in perception of residents both without statistical analysis. Empathy was the assessed in two studies[39, 40] by the same author and reported to increase significantly in one study[39] post-intervention and not in the other[40]. Three studies[17, 34, 67] assessed staff-rated skills in behaviour management or violence prevention post-intervention and all three studies reported a significant increase in staff-rated skills.

4.2.3 Care Staffs' Experiences of Resident Aggression

Twelve cross-sectional studies and 22 qualitative studies reported findings on the same topics: care aides' perception of resident aggression, care aides' perceived causes of resident aggression and care aide responses to resident aggression. While the quantitative data on these topics was limited, the qualitative findings seemed to build on the quantitative data contributing to the overall picture of care staff's experience of resident aggression. The findings are summarized below.

Care Aides' Perceptions of Resident Aggression

Only six cross-sectional studies[7, 24, 30, 35, 58, 62] reported on aspects of care aides' perception of resident aggression. These studies reported on different survey items with no two similar items appearing in more than one study. Some of these items were: care aides (47%; n=77) believed resident aggression was part of the job[58]; care aides (12.5%; n=111) reported the aggression as unexpected[75]; care aides (53%; n=83) were not optimistic anything could be done[62]; care aides (89%; n=83) believed that resident aggression was uncontrollable[62]; physical and verbal aggression were rated as the most difficult behaviour to manage (n=289)[30]; residents labelled on a special care unit were rated more problematic, inappropriate, and aggressive by

care aides than the same residents without the label (n=43)[24]; resident aggression was viewed as distressing (n=83; n=77)[58, 62]; resident aggression was believed to affect job satisfaction (n=77)[58].

Fifteen qualitative authors[1, 33, 41, 43, 49, 53-55, 58-60, 72, 73, 75, 79] investigated care staff's perceptual construction of resident aggression. Care staff reported resident aggression as unexpected[33, 43, 54, 59, 73] and occurring on a daily basis[33, 54, 55, 59, 72, 73, 79]. Resident aggression was described by care staff in nine different qualitative studies[1, 33, 53, 55, 58, 72, 73, 75, 79] as accepted and part of the job. It was common for care staff to report being unprepared to manage the behavior[49, 53, 59]. Qualitative studies reported care staff interpreting the behaviour towards them as unintentional[55, 58, 73, 75] and/or reported care staff believing it was intentional[1, 33, 41, 58, 73]. However, the studies which identified care staff believing the behaviour was intentional also identified care staff narrating that residents could not be held responsible[1], the behaviour was accepted[33], excusable[41], normalized[1] and ordinary[41]. One of these studies[58] reported staff working in a traditional unit were more likely to perceive the aggression as intentional and staff on a special unit attribute the behaviour to the disease. Additionally, perceiving resident aggression was reported as being in the 'eye of the beholder'[41]. Further, it was commonly reported that care staff felt blamed[33, 53, 60, 73, 75, 79] for resident aggression and had reluctance to report the aggression for this reason[33, 55, 60, 73].

Care Aides' Perceived Causes of Resident Aggression

Only three cross-sectional studies[7, 58, 62] reported care aides' perceived causes of resident aggression. Various causes were inquired about through questionnaires but majority (34%; n=83) of care aides in one study[62] believed cognitive impairment was the cause of aggression while majority in another study (n=77)[58] believed personal care was the cause. The third study[7] assessed various organizational factors that would reduce incidence of resident aggression but the findings revealed the majority (87.6%; n=97) believed talking among co-workers was the best solution to resident aggression.

A total of 12[5, 33, 37, 53, 59, 70, 72, 79-82, 95] authors used qualitative methods to describe care staff's perceived causes of resident aggression: ten[5, 33, 37, 53, 72, 79-82, 95] on individual care staff causes, seven[5, 33, 37, 53, 70, 79, 95] on facility or environmental causes and five[33, 37, 72, 79, 95] on resident causes. The most commonly identified individual factors to cause resident aggression was intrusion of personal space[37, 53, 59, 72, 79, 95] and the caregivers' approach[33, 37, 79-81, 95] or attitude[5, 53, 82]. Some examples of care approaches that were perceived as causing increased aggression were

not explaining care before delivering it[79], withdrawing attention from residents[79], ignorance[37], lacking thoughtfulness[95], and lacking communication[33]. Care staff's perceived organizational causes of resident aggression were heterogeneous and described in seven studies. Most commonly a lack of time and rushing was described as a cause of resident aggression[5, 37, 70, 79]. Next most commonly described was a lack of staffing[33, 53, 79] and a lack of training[33, 53]. A culture accepting of violence, high stress[33], heavy workloads[79] and working under pressure[95] was identified as increasing resident aggression. Additionally a culture lacking support and teamwork was thought to contribute to resident aggression[5, 53]. Lastly, regulations[33] and financial concerns[53] such as low pay, high turnover and lack of supplies influenced resident aggression from the perspective of care staff. Environmental causes of resident aggression were described in three studies[33, 53, 70] with only single study factors reported in each study. Causes of aggression were attributed to the residents by care aides' in five studies and was most reported as failing to understand[72, 79, 95]. Other resident factors were only described in one or two studies and were resident characteristics such as disease or dementia[37, 79] or sun-downing[33], loss of faculties[33, 95], manner of expression[95], and resident anger[33].

Care Aide Responses to Resident Aggression

Emotional Reponses

Frequencies of several care aide emotional responses were reported by seven authors[6, 7, 11, 56, 58, 62, 75]. Four studies reported on the frequencies of emotional responses. One of the most frequently reported care aide responses to resident aggression among these studies was anger[6, 7, 56] and frustration[62]. Fear in response to resident aggression was reported in five of the studies[7, 56, 58, 62, 75]. Three studies reported on the least frequently reported response to resident aggression, which were guilt[6, 7] and hurt/ hopeless/ helpless[62]. One large Canadian study reported 41% of care aides (n=415) felt inadequate because they could not deliver the care the residents deserved. Other emotions reported on were powerlessness[6, 7, 56], disappointment[56] and sadness[6, 56].

Ten qualitative authors[33, 43, 49, 53, 55, 59, 73, 75, 79, 95] explored and reported care staff's emotional responses to resident aggression. The most commonly identified care staff emotional responses in qualitative data were also fear[33, 53, 55, 59, 75], anger[33, 43, 53, 55, 59] and frustration[33, 55, 59, 75]. Additionally, as a result of resident aggression it was common for care staff to feel bad or have a bad conscience[33, 43, 49, 73]. Another common theme among qualitative data was care staff constantly felt at risk or on guard, were always aware of the potential for aggression and worried

about safety[43, 53, 55, 59, 79, 95]. Other care staff emotional reactions to resident aggression identified were powerlessness[33, 43, 73], physical and mental exhaustion[49, 59], sadness[33, 59], resentment[33, 59], humiliation[49] and ambivalence[33].

Behavioural Responses

Four cross-sectional studies[7, 12, 62, 66] reported frequencies of behavioural responses to resident aggression from care aides. All four studies reported substantial frequencies of leaving or isolating the resident in response to experiencing aggression: 19% (n=83) left resident alone[62]; 13.3% often left resident alone, 23.3% sometimes ignored the situation, and 16.7% often applied restraints and ignored the resident (n=60)[66]; 37% left resident and 2% ignored the resident (n=41)[12]; 12.4% ignored care recipient's need for help and some isolated the resident (n=97)[7]. Other survey items were only reported in one study. In reporting positive reactions, only 15% tried to calm patient (n=60)[66], 37% talked in a comforting manner (n=41)[12] and 89% continued providing care regardless (n=83)[62]. Negative reactions included: often appeasing resident like a child (48.5%; N=60)[66], often scolding the resident (25%; N=60)[66] and questioning the resident (24%; N=41)[12].

Through qualitative methods, six authors[43, 53, 55, 75, 79, 95] identified care staff's behavioural responses to resident aggression. The most often identified care staff response to resident aggression was distancing strategies such as walking away, avoidance, or withdrawal from the resident[53, 55, 75, 79]. Next most commonly mentioned was taking a time out[75, 79, 95] and losing control with retaliation while striving to regain control[43, 53]. The most commonly identified coping strategy was talking among coworkers about resident aggression[75, 79, 95] but other strategies such as working in pairs and time pacing and calming, fear reducing strategies[79] were mentioned.

Response Consequences

Only four cross-sectional studies[7, 56, 62, 75] reported consequences of resident aggression and the survey items were only reported in one or two studies. Care aides (14.4%, n=97; 39.9%; n=83) in two studies[7, 62] suggested pharmacological treatment as a consequence. Other consequences were care aides: changing departments[56], relocating resident[7], losing interest in their job and changing the way they work[75].

Six authors[33, 43, 49, 53, 59, 75] described the effect of resident aggression on care staff. All six qualitative studies described how care aides reported how their feelings and behaviours affected

quality of care. During narrative interviews, some care aides made a connection between tiredness and lack of patience that may result in poorer care[49]. In a qualitative questionnaire another group of care aides believed that their reluctance to engage with the aggressive residents compromised care[75]. In focus groups care aides reported that in consequence to aggression they no longer went the extra mile or gave extra attention to those residents[53]. In another study focus group, care aides believed that experiencing aggression affected their attitude and care quality toward those people[33]. For example, some quotes from the focus groups read that care aides were "less eager to spend time with these residents and less willing to answer their call lights" (p.19)[33]. Many said they felt guilty for their angry feelings but such feelings and behaviours were thought to affect the quality of care for residents[33]. As a result of experiencing aggression, in qualitative interviews care aides reported loss of control, distancing themselves and developing an attitude which the author suggested might decrease the quality of care to those residents[43]. The author believed the findings implied that preconceived ideas could cause deficits in the quality of care. For example, one quote from the interviews read "I started to treat her (aggressor) a little bit differently" (p.48)[43]. In one study[59] the care aides reported a decline in perceived amount and quality of nursing care they provided to aggressive residents. As additional consequences to experiencing aggression, care staff in one study[59] reported desire to leave the profession, home or unit and another study[49] reported that aggression was the main theme care staff reported as a destructive aspect on job satisfaction.

5. Discussion

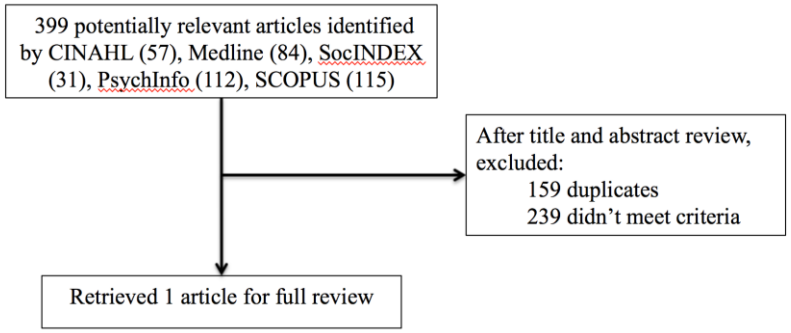
Through the literature it was made clear that there is a significant prevalence and incidence of resident aggression in LTC and it is a problem. However, large representative studies where authors actually sought to report incidence and prevalence of resident aggression were lacking making it difficult to report an overall incidence or prevalence. Findings were difficult to compare as incidence was measured with different tools and reported over different frequencies and time periods. The magnitude of the problem, according to the literature, is underestimated with events of resident aggression generally going underreported. The qualitative literature of care aides experience of resident aggression confirmed the overwhelming precense of resident aggression in LTC commonly describing it as an accepted part of the job occurring daily. Further, this aggression is depicted as a serious problem with several studies reporting care aide injuries serious enough to require medical attention.

The literature on care aide predictors of resident aggression was undeveloped; however, quality was investigated in one study[46] where increased quality deficiencies in a Norwegian nursing home were associated with increased resident aggression by staff. Other numerous predictors were evaluated but only by a small number of authors resulting in summaries of the available evidence yielding few conclusions. Further, although the studies were not quality assessed, the methodological strength is of question because many used small sample sizes and only bivariate analysis as the highest level of analysis. Nevertheless, several of the authors[32, 42, 58, 61, 95] who reported on predictors of resident aggression spoke to the potential effect of resident aggression on quality of care in the discussion section of their article. This provides urgency in the literature to investigate the effect on quality of care.

The qualitative literature raised further concerns about quality of care of aggressive residents with commonly reported themes in care aide responses. Care aides most commonly believed that the individual care staff person was the cause of resident aggression. Some care aide responses of believing resident aggression was intentional depicted them as not fully understanding resident aggression and lacking education. Further, serious concerns about quality of care follow the literature reporting the most common care aide responses to resident aggression were fear, anger and frustration and the most commonly reported behavioural response was isolation or distancing (e.g., walking away, withdrawal, avoidance). Consequences of resident aggression were addressed in only a few studies; however, it was common for care aides to report how their responses resulted in them providing poorer resident quality of care[33, 43, 49, 53, 59, 75], such as reluctance to engage with aggressive residents their compromised care[75]. In view of this literature, investigation into resident aggression and the effect on quality of care is lacking and warranted.

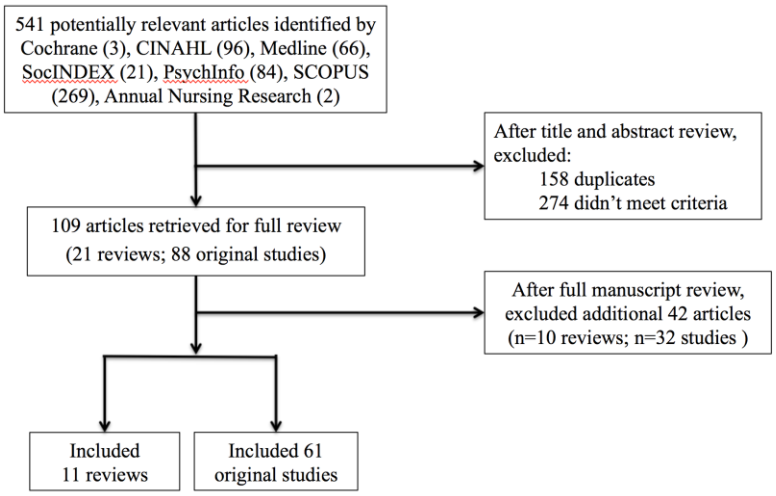
With this review, a gap in the literature on resident aggression and quality of care in LTC was highlighted. In addition, the broad literature overview on resident aggression towards care staff in LTC produced a summary of the current topics of focus in the literature. The research focused on effects of resident aggression on care aides instead of effects on the residents; however, much of the literature expressed a common concern for the effect of resident aggression on quality of care. With residents and their care quality increasingly important with the aging population, research into resident aggression and its effect on quality of care is in high demand.

Figure 3. Search one search strategy and keywords



Violence	
Aggress*	
Assault*	
Aggressive behavi*	OR
Disruptive behavi*	
Violence toward	
AND	
Patient outcome*	
Quality of patient care	OR
Quality of care	
Resident outcome*	
Impact on care	
Quality Indicator	
AND	
Nurses' Aide*	
Care aide*	
Care Attendant*	
Health care staff	
Careworker*	
Caregiver*	
Certified Nursing Assistant*	
Client Care Attendant*	OR
Direct care worker	
Geriatric Health Aide*	
Health Care Assistant*	
Nursing attendant*	
Nursing home aide*	
Personal Care Attendant*	
Personal Care Nurse*	
Personal Care Assistant*	
Personal Care Attendant*	
Personal Support Worker*	
AND	
Nursing home*	
Long term care	OR
Residential care	
Residential facilit*	

Figure 4. Search two search strategy and keywords



Violence	
Aggress*	
Assault*	
Aggressive behavi*	OR
Disruptive behavi*	
Violence toward	
AND	
Nurses' Aide*	
Care aide*	
Care Attendant*	
Health care staff	
Careworker*	
Caregiver*	
Certified Nursing Assistant*	
Client Care Attendant*	OR
Direct care worker	
Geriatric Health Aide*	
Health Care Assistant*	
Nursing attendant*	
Nursing home aide*	
Personal Care Attendant*	
Personal Care Nurse*	
Personal Care Assistant*	
Personal Care Attendant*	
Personal Support Worker*	
AND	
Nursing home*	
Long term care	OR
Residential care	
Residential facilit*	

Table 7. Study characteristics

Author(s) (Year)	Country	Care Setting	Aim(s) of the study	Design- Sample
Interventional Studies n=13				
Baker et al. (2006)	USA	Nursing home	To administer functional analyses and then to implement a time- and function-based intervention during relevant routines.	Experimental design 1 CNA and 1 resident
Burgio et al. (2002)	USA	4 nursing homes	To compare a variety of resident and staff outcomes across two types of staffing patterns, permanent and rotating assignment, and work shift.	Randomized clinical trial 88 residents; 85 CNAs
Chrzescijanski, Moyle, & Creedy (2007)	Australia	4 residential care settings	To measure residents' aggressive behavior before and after the implementation of a staff education intervention called Emotional Responses as Quality Indicators (ERIC).	Quasi-experimental: Simple interrupted time series- 43 residents and 87 "care staff" **Care staff not defined
Feldt, & Ryden (1992)	USA	Nursing facility	Education program (cognitive losses, precipitants of aggression, communication techniques, strategies to prevent aggression, managing personal feelings) for caregivers of dementia patients to reduce or prevent aggression	Quasi-experimental: Pre-Post Test- 17 NAs, 13 residents
Fitzwater & Gates (2002)	USA	2 nursing homes	To test the effectiveness of an educational intervention to decrease violence toward CNAs in nursing homes.	Quasi-experimental 20 CNAs
Gates, Fitzwater, & Succop (2005)	USA	6 nursing homes	To test the effectiveness of a violence-prevention intervention, on the basis of Social Cognitive Theory to increase knowledge, self-efficacy, and skills and to decrease assaults.	Quasi-experimental 138 NAs
Irvine et al. (2011) (was 2012a)	USA	Online -LTC workers	Evaluated Internet training to teach NAs strategies to prevent or react to resident aggression in ways that are safe for the resident and caregiver.	Randomized treatment and control design 159 NAs/CNAs
Irvine et al. (2012) (was 2012b)	USA	6 LTC facilities	Evaluated Internet training to teach nurse aides (NAs) strategies to work with aggressive resident behaviors.	Experimental: immediate treatment (IT) and delayed treatment (DT) design IT: n 58; DT; n 45 NAs
Lantz et al. (1997) (was Buchalter et al., 1996)	USA	1 nursing facility	To explore benefits of a group therapy program for residents with dementia and the care staff.	Experimental: 1 intervention group and 1 control group 14 residents, 7 care staff

Mentes & Ferrario (1989)	USA	Nursing home	Discusses an educational program to train NAs to interact with residents to minimize aggressive episodes.	Quasi-experimental: Post education sessions questionnaire NA sample size not reported
Oh et al. (2005)	Korea	Nursing home	1) Describe the type and frequency of aggressive behavior of cognitively impaired nursing home resident, 2) develop a caregiver training program on prevention and management of aggressive behavior, 3) examine the effects of caregiver training program on the incidence of aggressive behavior of cognitively impaired nursing home resident, and 4) examine the effects of caregiver training program on nursing staff's aggressive behavior management skills.	One-group, time series, quasi-experimental design with a pre-test and two post- tests was used. residents (N = 32) and nursing staff (N = 36) (17 NA, 19 RN)
Roth et al. (2002)	USA	2 nursing homes	Timed-event sequence analysis methods were applied to previous data to test hypothesis about possible antecedent-consequent sequential relationships between CNA behaviors and resident agitation.	Secondary analysis? of observation pre/post teaching program quasi 30 residents and 59 CNAs
Skovdahl et al. (2007)	Sweden	1 nursing home in a dementia unit	To describe from documentation both the caregivers' experiences of giving tactile stimulation to five people with moderate-to-severe dementia and who showed aggressive or restless tendencies, and the changes seen in them.	Qualitative: From caregivers' documentation of experiences, the giving of tactile stimulation.5 residents with dementia showing aggression and 40 care staff care staff not defined
Prevalence and Incidence (n=8)				
Astrom et al. (2002) Incidence of violence towards staff caring for the elderly Scand. J. Caring Sci.	Sweden	114 staff in Group dwellings, 290 staff in Home care, 131staff in Sheltered Housing, 256 staff Nursing Homes Separate analysis by setting but not by staff	INCIDENCE/FACTORS/RESPONSES Investigate the **incidence** of violence directed towards staff by the elderly people living in residential settings and ordinary homes and relationships between violent incidents and any of the variables: **gender, age, years in service, years at present workplace, education of the staff, type of setting,** the frequency and type of violence as well as the **emotional reactions** expressed by the staff.	Cross sectional survey 506 "Staff" in elder care (52 RN's, 173 Assistant nurses, 281 NAs) Separate analysis by setting but not by staff

Banerjee et al. (2012) Structural violence in long-term, residential care for older people: Comparing Canada and Scandinavia Soc.Sci.Med)	Canada (vs. Nordic	Nordic Countries: Denmark, Sweden, Finland, Norway Residential care for older people Canada: MB, NS, ON LTC facilities	Compares working conditions in Canadian and Scandinavian LTC facilities	MIXED: Cross-sectional with qualitative open margins in survey for some questions and 9 Canada focus groups Canada 415 PSWs only; PSW and LPN data in Denmark 409, Finland 449, Norway 441, Sweden 326
Lachs et al. (2012) Verbal and Physical Aggression Directed at Nursing Home Staff by Residents J Gen Intern Med	NY, USA	5 randomly selected urban nursing homes	To estimate the prevalence of resident-to- staff aggression (RSA) over a 2-week period.	Prevalent cohort study Population-based sample of 1,552 residents and 282 certified nursing assistants.
Oh et al. (2004) A study on aggressive behavior among nursing home residents with cognitive impairment. Taehan Kanho Hakhoe Chi	Korea	2 nursing homes	Incidence and RESPONSES To answer the questions:1) the proportion and nature of aggressive behavior, 2) the frequency and types of aggressive behavior, 3) the difference between the residents who demonstrate aggressive behavior and those who do not, 4) nursing staff responses to aggression	Cross-sectional descriptive study 60 nursing staff (nurses and nursing assistants)and 205 residents no separate analysis
Schreiner (2001) Aggressive behaviors among demented nursing home residents in Japan Int.J.Geriatr.Psychiatry	Japan	6 nursing homes	Incidence and FACTORS To provide data on the frequency and distribution of aggressive behaviors and possible relations to sex, age, and self- care ability; to explore caring staff's attitudes about such behavior	Retrospective Study 391 residents with dementia (nursing home staff rated each resident with the instrument 51 caregivers qualitatively wrote down their impressions of their major caregiving concerns.) Not broken down

Sharipova et al. (2008) Prevalence, seriousness and reporting of work-related violence in the Danish elderly care Scand.J.Caring Sci.	Denmark	Elder care: nursing homes, home care, integrated institutions.	1 What is the prevalence of work-related violence in elder care; who are the perpetrators; what types of violence are most prevalent? 2 How serious is the WRV: what is the prevalence of injuries and sickness absence connected with violent incidents and how do the victims rate most serious incident? 3 To what extent do victims of physical violence report the incidents and what characterizes the incidents with respect to: the type of violence; whether they sustained physical injury; the duration of sick leave (if any), self-rated seriousness; and does type of perpetrator influence reporting of incidents?	Cross sectional survey/ questionnaires Only direct care workers (n = 8134). The majority of the participants worked in nursing homes (n = 3092) and in home care (n = 2649). Does not define direct care workers titles Only separate analysis for setting for prevalence of violence/ no separate analysis for anything else i.e., groups settings together
Snyder et al. (2007) The underreporting gap in aggressive incidents from geriatric patients against certified nursing assistants Violence Vict.	USA	6 geriatric facilities	INCIDENT AND OUTCOMES Investigates aggressive incidents from patients against CNAs in geriatric care facilities, incidence, reporting, reasons why nursing staff decide to report incidents, and relation to subsequent organizational commitment, job satisfaction, and intent to leave the job.	Cross sectional survey (5 times/Time Series) 76 CNAs
Beck et al. (1992) Improving documentation of aggressive behavior in nursing home residents J.Gerontol.Nurs.	USA	long-term geriatric division in a hospital with four units with 168 beds	REPORTING Report staff documentation of physically aggressive acts by geriatric residents in a LTC facility, who reported, when and where incidents occurred, and how often residents had visitors.	Retrospective, descriptive design (forms, chart reviews) 38 residents who were identified as aggressive by caregivers, RNs, LPNS, and nursing assistants NO #
Studies on Factors That Affect Aggression (n=16)				
Astrom et al. (2002) Incidence of violence towards staff caring for the elderly Scand. J. Caring Sci.	Sweden	114 staff in Group dwellings, 290 staff in Home care, 131staff in Sheltered Housing, 256 staff Nursing Homes Separate analysis by setting but not by staff	Investigate the incidence of violence directed towards staff by the elderly people living in residential settings and ordinary homes and relationships between violent incidents and any of the variables: gender, age, years in service, years at present workplace, education of the staff, type of setting, the frequency and type of violence as well as the emotional reactions expressed by the staff.	Cross sectional survey 506 "Staff" in elder care (52 RN's, 173 Assistant nurses, 281 NAs) Separate analysis by setting but not by staff

Bostrom et al. (2012) Workplace aggression experienced by frontline staff J.Clin.Nurs	Canada?	4 Nursing units	• How frequently do frontline staff experience aggressive acts? • Who initiates aggressive acts towards frontline staff? • Do frontline staff report aggressive acts? • To whom do frontline staff report aggressive acts? • What factors related to the work context and to care providers are associated with the frequency of aggressive acts?	Cross sectional survey 91 total with 73 HCAs and 18 LPNs
Gates et al. (2003) Relationships of stressors, strain, and anger to caregiver assaults Issues Ment.Health Nurs.	USA	6 nursing homes	To describe the context in which assaults occur against NAs from residents in nursing homes and to identify characteristics of the NAs in relation to the incidence of assaults.	Cross sectional survey 138 NAs
Isaksson et al. (2009) Factors associated with the prevalence of violent behaviour among residents living in nursing homes J.Clin.Nurs	Sweden	10 nursing homes consisting of 33 wards	To investigate the associations between environmental and organizational factors as well as resident and caregiver characteristics in nursing home wards with a high respectively low prevalence of residents with violent behavior	Cross-sectional descriptive survey design 450 residents and 364 caregivers (RNs, enrolled/student nurses and NAs) NO separate analysis by staff type
Isaksson et al. (2008) Exposure to violence in relation to personality traits, coping abilities, and burnout among caregivers in nursing homes: a case-control study Scand J Caring Sci	Sweden	3 nursing homes	Explores the relationship between perceived exposure to violence and demographical factors, parental rearing, personality traits including coping abilities, defense styles, and burnout among caregivers working in nursing homes.	Case-control study (or matched design) 196 caregivers for first part/background data (27 RNs, 118 assistant nurses and 51 nurse aides) working in nursing homes (but really total only 40 total because could only match 20 who experienced no violence and 20 who experienced violence matched)

Levin et al. (2003) Assault of LTC personnel J Gerontol Nurs	USA	8 LTC facilities	Exploratory study/focus group sessions: to explore the factors contributing to assault on LTC personnel ● Determine the perceptions of LTC workers about worker, work- place, and environmental factors contributing to the incidence of assault and its consequences. ● Determine short- and long-term effects of violence on LTC workers. ● Use workers' experiences to identify possible solutions to violence in LTC facilities	Qualitative exploratory study 7 CNAs, 1 administrator
Morgan et al. (2005) Work stress and physical assault of nursing aides in rural nursing homes with and without dementia special care units J.Psychiatr.Ment.Health Nurs.	Canada	16 nursing homes	T0 determine differences between NAs working in rural nursing homes either with or without an SCU regarding job strain, exposure to disruptive or aggressive behaviors, and related stress	Cross-sectional survey: 355 NAs
Sharipova, Hogh, & Borg (2010) Individual and organizational risk factors of work-related violence in the Danish elder care Scand.J.Caring Sci	Denmark	38.1% of sample worked in nursing homes, 32.6% in home care (in elderly persons home), 22.5% integrated institutions (both nursing homes and home care), and 6.8% activity centers	To explore individual and organizational risk factors of exposure to violence in the Elder Care Sector.	Cross sectional survey/ questionnaire 8134 direct care personnel (HCAs and activity therapists), working with personal care and practical help to elderly people In NURSING HOMES (60.9% HCA, 66.7% uneducated nursing personnel, 18.6% RN, 17.5% activity people) occupation and setting was compared but no real separate analysis for factors for each
Zeller et al. (2012) Factors Associated With Resident Aggression Toward Caregivers in Nursing Homes	Switzerland	21 nursing homes	To explore the caregivers' experiences with aggressive behavior from residents and to identify environmental factors as well as caregiver and resident characteristics related to aggressive behavior in Swiss nursing homes.	Cross-sectional survey 814 caregivers (345 RNs, 207 enrolled/student nurses, 212 NAs, 35 other, 5 missing) no separate analysis

J.Nurs.Scholarsh Quan				
Evers et al. (2001) Effects of aggressive behavior and perceived self-efficacy on burnout among staff of homes for the elderly Issues Ment Health Nurs	Netherlands	22 'elderly care homes'	To examine the relationship between aggressive behavior and MBI burnout among care staff.	Cross sectional survey 551 care staff Care staff not defined
Evers et al (2002) Aggressive Behavior and burnout among care staff Int J Ment Health Nurs	Netherlands	22 'elderly care homes'	To examine the relationship between aggressive behavior and burnout among care staff.	Cross sectional survey 551 care staff Care staff not defined
Goodridge et al. (1996) Conflict and aggression as stressors in the work environment of nursing assistants: implications for institutional elder abuse. J Elder Abuse Negl	MB, Canada	1 LTC facility	To examine NA - resident conflict, aggression towards NAs from residents and the relationship of conflict and aggression to burnout	Cross-sectional survey 126 nursing assistants
Kirkevold & Engeldal (2008) Quality of care in Norwegian nursing homes -- deficiencies and their correlates Scand.J.Caring Sci.	Norway	251 wards (91 special care units and 160 regular units) in LTC	To explore which variables are associated with low Quality of Care in few and several areas respectively.	A structured interview of the patients' primary carer. the patients' primary carer of 1926 patients (1360 patients in RUs and 564 in SCUs)
Mandiracioglu & Cam (2006) Violence exposure and burn-out among Turkish nursing home staff Occup. Med	Turkey	6 nursing homes	INCIDENCE AND FACTORS To describe the frequency of violence against personnel from residents and to identify the prevalence of Pines burn-out scale among staff working in nursing homes.	Cross sectional survey 214 nursing home staff (23 healthcare workers, 21 office employees, 21 NAs, 15 social work and psychologists, 102 cleaners, 32 others) No separate analysis

Scott et al. (2011) Psychological trauma and fear for personal safety as a result of behaviours that challenge in dementia: The experiences of healthcare workers Dementia	Ireland	9 care homes	To explore relationship between behaviors that challenge and fear for personal safety among staff caring for people with dementia. The objectives were: Examine the effects of fear on psychological well being; To identify current coping strategies; To identify the level of support available to staff; To make recommendations for guidelines to support staff.	2007 exploratory study/ cross sectional postal Questionnaire 112 (43 nurses and 69 care assistants)
Tak et al. (2010) Workplace assaults on nursing assistants in US nursing homes: a multilevel analysis Am. J. Public Health	USA	582 nursing homes	Examine risk factors for injuries to nursing assistants from assaults by nursing home residents at both the individual and the organizational level.	Secondary analysis of 2004 NNAS and NNHS surveys (telephone interviews) 2888 nursing assistants working in nursing homes
Studies on Experience Of Resident Aggression (n=26)				
Åkerström (2002) Slaps, punches, pinches- but not violence: Boundary-work in nursing homes for the elderly Symb. Interact.	Sweden	2 nursing homes during 1990	How nursing home staff does boundary-work on the topic of violence by elderly patients	Qualitative reanalysis: group interviews, individual interviews, and held observations Primarily: 3 nurses and 15 auxiliary nurses; In 2001 interviewed an auxiliary nurse working at a nursing home and 4 of her colleagues Identifies who says what but overall together
Anderson et al. (1998) Entering the world of dementia: CNA interventions for nursing home residents J. Gerontol. Nurs,	USA	2 nursing homes (restraint and pharmacological free when dealing with aggression)	Describe interventions used by CNAs as they care for older adults with dementia who exhibit aggression with aims to describe CNAs perceptions, CNA values and experiences.	Qualitative descriptive study/ interviews 7 CNAs

Astrom et al. (2004) Staff's experience of and the management of violent incidents in elderly care Scand .J. Caring Sci.	Sweden	8 nursing homes, 5 sheltered housing sites, 11 group dwellings	Structured telephone interviews: to record emotional reactions and the management modes of violent incidents among staff exposed to violence	Cross sectional survey/structured telephone interviews RNs, assistant nurses, nurse's aides (574 in nursing homes, 140 in sheltered/assisted housing facilities, and 134 in group dwellings/dementia care)
Beck et al. (1990) Caregivers' perception of aggressive behavior in cognitively impaired nursing home residents J Neurosci Nurs	USA	1 skilled care nursing facility and 1 LTC unit in hospital	Describe characteristics of aggressive behaviors from residents as described by the caregivers.	Cross sectional Interviews/Questions Reported frequencies like a survey 21 nurses; 20 NAs No separate analysis
Doyle & Marco (2011) The Effect of Labeling on Employee Perceptions of Residents Living on Alzheimer's Disease Specialized Care Units J AM Med Dir Ass	USA	2 nursing homes (one rural, one urban) in New England.	Examined whether labeling influenced nursing home employees' perceptions of residents and how those perceptions could affect resident-caregiver interactions.	small descriptive study using vignettes and questionnaires/Cross-sectional 8 RNS, 5 LPNS, 17 CNAs, 2 social work, 9 activities. 2 therapy Not separate analysis
Fisher et al. (1993) Frequency and management difficulty of behavioral problems among dementia patients in LTC facilities Clin. Gerontol	USA	84 nursing facilities	To examine the relationship between the frequency of behavior problems and nursing staff perceptions of management difficulty among dementia patients in LTC facilities.	Cross sectional survey 289 staff members (118 CNAs (47.6%), 66 LPNs (26.6%), 64 RNs (25.8%) No separate analysis by staff
Gates et al. (2004) Preventing assaults by nursing home residents: nursing assistants' knowledge and confidence-a pilot study J Am Med Dir Assoc	USA	6 nursing homes	To describe the frequency and context of assaults against NAs from residents and to describe NAs' beliefs about their violence prevention knowledge and self-efficacy to prevent assaults from residents.	Cross sectional survey 138 Nursing Assistants

Graneheim et al. (2012) Female caregivers' perceptions of reasons for violent behaviour among nursing home residents J. Psychiatr. Ment. Health Nurs	Sweden	3 nursing homes	Aims to explore female caregivers' perceptions of the reasons for violent behavior among nursing home residents	Qualitative interviews 41 caregivers chosen from 196 from another study - 21 who had experienced violence and 20 who had not: NAs (n = 8), enrolled nurses (n = 23) and RNs (n = 10)
Isaksson et al. (2009) Female caregivers' experiences of exposure to violence in nursing homes. J. Psychiatri Ment Health Nurs	Sweden	3 nursing homes	Illuminates female caregivers' experiences of being exposed to violence in nursing homes.	Qualitative interviews 20 female caregivers, all of whom had reported being exposed to violence was selected; NAs (n = 5), enrolled nurses (n = 10) and RNs (n = 5)
Isaksson, Astrom et al. (2008) Violence in nursing homes: perceptions of female caregivers J. Clin Nurs	Sweden	3 nursing homes	Illuminates how female caregivers in nursing home perceive violence.	Qualitative interviews with vignettes 20 female caregivers, all of whom had reported being exposed to violence; NAs (n = 5), enrolled nurses (n = 10) and RNs (n = 5)
Kristiansen et al. (2006) Swedish NAs' experiences of job satisfaction when caring for persons suffering from dementia and behavioral disturbances. An interview study Intern Journal of Qual Studies on Health & Well-Being	Sweden	2 group dwellings/like LTC	To describe the experience of job satisfaction among nursing staff working at two GDs for people suffering from dementia with behavioral disturbances.	Qualitative, narrative interviews 2 RNs, 18 support workers (16 called assistant nurses and 2 called nursing assistants)

Lusk (1992) Violence experienced by nurses' aides in nursing homes: an exploratory study. AAOHN J	USA	Nursing homes (# not reported)	Exploratory study to develop an overall picture of aides' work experiences in nursing homes	Exploratory Study/Qualitative focus groups and observation NAs in focus groups with 7 to 27 in each group (total # not reported)
Manderson et al. (2005) How caregivers respond to aged-care residents' aggressive behaviour KAI TIAKI NURS NZ	New Zealand	14 residential care facilities	Explore the attitudes and responses of residential caregiving staff to aggressive behaviour from residents.	Qualitative/ interviews 25 caregivers - 12 from dementia units and 13 from general residential care (caregivers not defined)
MacDonald (2007) Care assistants' views and experience of 'challenging behaviour' in dementia J. Dementia Care	UK	2 long-stay care homes (>15% residents known dementia)	Explore views and experiences of care assistants in LTC	Qualitative interviews 5 care assistants from each care setting -Not reported as a total but I think 10?
Middleton et al. (1999) Caregiver distress. Related to disruptive behaviors on special care units versus traditional LTC units J.Gerontol.Nurs.	Canada	2 SCU and 3 TU in 3 facilities	To compare perceptions of formal caregivers on special care unties (SCU) to staff on traditional units (TU) regarding their relationships with residents in LTC, their reports of exposure, and their repots of distress.	Comparative survey/Questionnaire Qualitative 77 convince sample of staff: 39 SCU staff and 38 TU staff (balanced) (9 nursing staff, 26 resident attendant, 4 therapy staff)
Miller (1997) Physically aggressive resident behavior during hygienic care J. Gerontol Nurs	USA	1 dementia special care unit	TO explore nursing staff members' responses to physically aggressive patient behavior and the effect that physically aggressive behavior had on them personally and on their nursing practice	Qualitative study/interview 27 nursing staff: 8 LPN, 2 RN, 17 CNAs; 54 interviews and majority was CNAs because they are the hands on and their views dominate this research p.28

Morgan et al. (2012) Nursing aide reports of combative behavior by residents with dementia: results from a detailed prospective incident diary J Am Med Dir Assoc	Canada	11 facilities in SK	Examined nursing aides' (NAs) perspectives of specific incidents of combative behavior from nursing home residents with dementia, particularly their attributions for the behaviors	Part of a larger mixed-method study: cross-sectional survey design. Phase I: NAs used a prospective event-reporting log or "diary" to record consecutive incidents of combative resident behaviors. 83 NAs
Morgan et al. (2008) Taking the hit: focusing on caregiver "error" masks organizational-level risk factors for nursing aide assault Qual Health Res	Canada	11 facilities in SK	Reports on two issues: the organizational context that contributes to nursing aide (NA) assault and reporting, and serendipitous findings that arose from investigating unexpected response rates to a survey.	Qualitative: Phase II of above study: 19 focus groups conducted 138 NAs (9"barriers" focus groups: 74 NAs, attendance ranging 2-16 NAs/meeting; 10 focus group interviews to explore NAs' perceptions of caring for physically aggressive residents 63 NAs, group size ranging from 2-10 NAs
Ragneskog & Kihlgren (1997)	Sweden	Nursing homes and collective residential units	To explore caregivers' experiences of agitated patients with dementia and strategies to improve their care.	Qualitative 17 formal caregivers (8 RNs and 8 "nursing staff")
Scandvide et al. (2004) Violence in institutional care for elderly people from the perspective of involved care providers Scand.J.Caring Sci	Sweden	8 Nursing homes, 5 group dwellings, 11 sheltered housing	Qualitative study/telephone interviews: to study violent events experienced and described by care providers	Qualitative descriptive study/telephone interviews 39 care receivers; 57 care providers (NAs, assistant nurses, RNs)
Scandvide et al. (2010) How care providers construct and frame problems related to violence in institutional care for older people Commun.Med.	Sweden	Housing for older adults	To describe how care providers discursively constructed and framed problems related to the occurrence of violence in their interactions with older persons in institutional care	Qualitative interviews 46 care providers (nurse aides (n = 21), assistant nurses (n = 21) and RNs (n = 4)

Shaw (2004) Aggression toward staff by nursing home residents: findings from a grounded theory study SourceJ.Gerontol.Nurs	USA	6 nursing homes	To present ‘‘real-world’’ perspectives on the conditions and context of resident aggression and practical strategies used to prevent and manage aggression, as described by care staff	Qualitative Grounded theory/interviews 15 nursing home staff (9 nursing assistants, 3 RNs, and 3 nursing home administrative staff), 6 investigators
Skovdahl et al. (2004) Dementia and aggressiveness: stimulated recall interviews with caregivers after video-recorded interactions J Clin Nurs	Sweden	2 units, from 2 different nursing homes	To obtain insight into the reasoning of the caregivers who had reported problems when dealing with older people with dementia/ aggressiveness and those who did not relative to their respective video- recorded interactions. A further aim was to gain insight by discussing their reasoning in relation to each other.	Qualitative: Stimulated recall interviews 9 caregivers (same 9 who participated in the video recordings study, 2003) (3 NAs and 6 ENs)
Skovdahl et al. (2003a) Dementia and aggressiveness: video recorded morning care from different care unit J Clin Nurs	Sweden	2 LTC units	To illuminate interactions between individuals with dementia who exhibit aggressive behavior and caregivers with and without aggressive behavior using video recordings (Both residents were recorded on video, 3 times each, in interactions with 1 or 2 caregivers on each video sequence)	Qualitative Phenomenological hermeneutic approach 2 residents; 9 caregivers (3 NAs and 6 ENs)
Skovdahl, Kihlgren, & Kihlgren (2003b) Different attitudes when handling aggressive behavior in dementia -- narratives from two caregiver groups Aging Ment Health	Sweden	3 LTC units	To study caregivers’ reflections about and attitudes toward behavioral and psychiatric symptoms of dementia and caregivers’ handling of symptoms	Qualitative Phenomenological-hermeneutic approach/narrative interviews: 15 formal caregivers
Zeller et al. (2011) Nursing home caregivers' explanations for and coping strategies with residents' aggression: a qualitative study J Clin Nurs	Switzerland	4 nursing homes	Explored caregivers’ perspectives regarding the conditions and situations of resident aggression and practical strategies caregivers use to deal with aggression.	Qualitative study(semi-structured interview guideline) with 5 focus group 30 participants (18 RNs, 5 nursing assistants and 7 nursing students.)

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