Relational Mealtimes in Long-Term Care: Understanding the context of care at mealtimes for residents with eating and other mealtime challenges

by

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The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

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Author's Declaration

This thesis consists of material all of which I authored or co-authored: see Statement of Contributions included in the thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Statement of Contributions

Sarah A. Wu was the sole author for Chapters 1, 2, 3, 7, and 8, which were written under the supervision of Professor Heather Keller and were not written for publication.

The three manuscripts presented in this thesis, that have been published or submitted for publication, are the work of Sarah A. Wu, in collaboration with her co-authors and committee members. Exceptions to sole authorship include:

Chapter 4: Wu, S.A., Morrison-Koechl, J. M., McAiney, C., Middleton, L., Lengyel, C., Slaughter, S., Carrier, N., Yoon, M.N. & Keller, H. H. (2021). *Multi-level factors associated with relationship-centred and task-focused mealtime practices in long-term care: A secondary data analysis of the M3 Study.* Manuscript submitted for publication.

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As lead author of these three chapters, Sarah A. Wu was responsible for conceptualizing study design, analysis, drafting the first version of the paper, finalizing, and submitting manuscripts. All three chapters were based on the Making the Most of Mealtimes Study and led by lead investigator, Professor Heather Keller, with support from an extensive team of Canadian experts.

Co-authors provided theoretical and methodological guidance and thoughtful feedback on draft manuscripts. All co-authors approved the manuscripts before submission and publication, with full knowledge that the publication would be included in the doctoral thesis of Sarah A. Wu.

Abstract

Background: Mealtimes in long-term care (LTC) are essential to resident health and well-being, as eating with others helps to reinforce relationships between those who live and work in these homes and their relationships to the greater community. The evolution of the culture change movement within the LTC sector promotes the adoption of social models of care, such as relationship-centred care (RCC), to improve the everyday lives of residents, including at mealtimes. Malnutrition is a serious and on-going issue among residents living in LTC homes, where 44% of Canadian residents were found to be malnourished largely due to food access issues (e.g., eating ability, dysphagia). Addressing these issues requires a relational understanding of factors that can impact resident mealtimes, and the conditions under which care is provided. Families continue to play an important role in the lives of residents and provide additional support when needed, though their contributions continue to be overlooked. Informed by relational theory, this dissertation aimed to understand how multi-level interacting factors shape the conditions of care, the mealtime experience, and ultimately the well-nourishment of residents.

Methods: All parts that comprise this dissertation use secondary data from the Making the Most of Mealtimes (M3) Study, a cross-sectional study that examined multi-level factors associated with food and fluid intake among 639 residents across 32 Canadian LTC homes in four provinces (AB, MB, ON, NB). Part 1 of this dissertation aimed to explore the multi-level factors at the resident-, dining room-, and LTC home system-levels that may impact mealtime care, specifically associations with staff RCC and task-focused (TF) mealtime practices. Descriptive and association analyses were conducted to determine independent associations between multi-level factors and these RCC and TF mealtime care practices. Recognizing that relationships and how eating assistance is provided may impact food intake, the study in Part 2 aimed to explore the potential impact of a family member providing mealtime eating assistance on resident energy and protein intake, as compared to when staff provided this assistance. Descriptive and

association analyses were conducted to determine the independent association between energy and protein intake with family eating assistance versus staff assistance in a subset of residents requiring physical eating assistance (n= 147). Mealtime experiences of food intake and social interactions can be influenced by many factors, including the resident's capacity for verbal communication, including vision and hearing abilities. Challenges in communication may be exhibited as wayfaring during meals. Part 3 of this thesis explored the association between resident sensory impairment, communication capacity, wayfaring during the meal, staff mealtime care practices (RCC and TF), and family food involvement (providing eating assistance, bringing food into the home) with the outcome of nutrition status (malnourished vs. well-nourished). Descriptive and association analyses were conducted to determine which of these resident, staff and family variables had the potential to impact resident nutritional status.

Results: Using a standardized mealtime observation tool to determine mealtime practices in Part 1, it was noted that RCC practices (9.6±1.4) were more common than TF practices (5.6±2.1). Almost one quarter of participants required eating assistance (n=634; 23.2%). Mealtime RCC and TF practices were associated with multi-level factors: TF practices were more likely to occur with larger home size, care continuums, more staff involved in assisting, male residents, and residents requiring eating assistance. RCC practices were observed more often in for-profit homes, those with recent renovations, and female residents.

Results from Part 2 found that of those residents who required any physical eating assistance (N=147), almost 40% had a family member provide assistance during at least one of nine meal observations. Statistically significant differences in eating challenges (i.e., dysphagia risk) and type of home area (i.e., specialized dementia care units) were found between those residents who received family assistance (n=56) compared to those who did not (n=91). Family assistance was independently associated with a significantly higher consumption of both protein and energy intake when compared to staff assistance for meals in these same participants (n=56).

Results from Part 3 found that 44% of the resident sample were malnourished. Vision and hearing deficits (despite use of usual aids) affected almost 20% of participants, while verbal communication challenges affected over a quarter of residents. Wayfaring at meals was observed among almost 4% of residents. Statistically significant differences in characteristics were found between well-nourished and malnourished residents. Vision impairment, communication challenges, wayfaring, family member mealtime presence, and fewer RCC mealtime practices were independently associated with resident malnutrition.

Conclusion: This dissertation provides insight into some of the relational aspects of mealtimes within Canadian LTC homes. More specifically how capacity for resident participation in meals (e.g., wayfaring, verbal communication), requirement of physical eating assistance, staff mealtime care practices, and family participation are linked to higher level structures that impact the innermost mealtime interactions resulting in differences in food intake and malnutrition. Findings from this dissertation support a refocusing of efforts in the culture change movement on these most vulnerable residents with eating and other mealtime challenges. Future work should target the conditions of care as they relate to mealtimes and translate into RCC practices, which includes the dining environment, organizational culture, and governing bodies.

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Dedication

This work is dedicated to the long-term care residents
and staff who lost their lives during the COVID-19 pandemic.

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List of Abbreviations

ABS = Aggressive Behaviour Scale

ADL = Activities of Daily Living

ADL-LF = Activities of Daily Living – Long Form

ANOVA = one-way analysis of variance

BMI = Body Mass Index

CI = Confidence Interval

CPS = Cognitive Performance Scale

DEAP = Dining Environment Assessment Protocol

DRS = Depression Rating Scale

Ed-FED-Q = Edinburgh Feeding Evaluation in Dementia Questionnaire

ICC = Interclass Correlation Coefficient

IDDSI = International Dysphagia Diet Standardization Initiative framework

LTC = Long-Term Care

LTCF = InterRAI Long-term care Form

LTCHA = Long Term Care Homes Act 2007

M3 = Making the Most of Mealtimes Study

MNA-SF = Mini-Nutritional Assessment – Short Form

MTD = Modified Texture Diet

MTS = Mealtime Scan for Long-Term Care

M-RCC = Mealtime Relational Care Checklist

OR = Odds Ratio

PCC = Person-Centered Care

PG-SGA = Patient Generated-Subject Global Assessment

RA = Research Assistant(s)

RCC = Relationship-Centred Care

RLWD = Resident(s) living with dementia

SD = Standard Deviation

TF = Task-Focused

When one takes dependence seriously
one must also take care seriously.

- Jennifer Nedelsky

Chapter 1: Introduction and Overview

The illustrious social anthropologist Mary Douglas once wrote,

> *"Drinks are for strangers, acquaintances, workmen, and family. Meals are for family, close friends, honored guests. The grand operator of the system is the line between intimacy and distance. Those we know at meals we also know at drinks. The meal expresses close friendship."*
>
> (Douglas, 1975, p.41).

If we use this statement to frame this dissertation and thus the phenomenon of mealtimes within institutional settings[1], specifically long-term care (LTC), we can then approach meals in this context with the understanding that food and food systems have enormous social implications: they are ritualistic, with patterns that indicate how a culture socially constructs its hierarchy and relationships. This conceptualization of mealtimes not only provides fodder for this doctoral research but is consistent with the current discourse surrounding the purposes of mealtimes in LTC. However, this social focus of mealtimes is often deprioritized. By holding this concept that meals are social and nurture relationships as a central tenet in this thesis, it allows for the identification of areas in need of further consideration and modification in order to support meaningful relationships in LTC contexts, including the participation and inclusion of family members[2] within LTC homes. It is further noted that social aspects of mealtimes are not only an outcome of eating with others, but also can be a vehicle for improved food intake and thus reduction of malnutrition in residents. For residents living with dementia

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[1] LTC settings are often referred to as "homes", as there is a concerted effort through a culture change movement to create "home-like environments". However, current research indicates that a biomedical approach maintains its stronghold over the lives of those who live and work within these environments – including mealtimes. For this reason, the author (SAW) will at times refer to LTC homes as a "facility" or "institution".

[2] Within this dissertation, the terms "family", "families", and "family member" refer to those who are biologically related to the resident, as well as those non-biological relations who are important members of the residents' social network (e.g., friends, companions, neighbours, volunteers etc.) (e.g., Stall et al., 2019).

(RLWD) who experience circumstances which can make negotiating and achieving supportive relationships challenging, the capacity of mealtimes to meet this need is magnified. These interactions are further impinged by communication, vision, hearing challenges, and the need for wayfaring during meals. Although this thesis is not solely based on residents living with dementia, many of the issues that result during mealtimes as they currently stand are a result of an increasing number of residents with cognitive impairments and the interaction with unsupportive social and physical care environments. Further, much of the research on mealtimes to date takes into account this group of residents due to their increased vulnerability.

As of 2014, there were 402,000 older adults living with dementia in Canada, two thirds of whom were women; this number is expected to increase by 68% over the next 20 years (CIHI, 2018). The majority of these individuals will eventually transition into LTC homes at some point in their dementia journey, as they experience greater need for support in their day-to-day lives (McGilton et al., 2012). Among those RLWD in LTC homes, 40% are further along in their dementia journey (i.e., moderate to advanced stages of dementia) (CIHI, 2018). Most often these RLWD will experience unique challenges during mealtimes, as changes in memory, neuromuscular processes, and communication and sensory impairments can make eating difficult for upwards of 70%, especially without eating assistance from others (Dev et al., 2014; Loughrey et al., 2018; Muurinen et al., 2014; Namasivayam-MacDonald et al., 2017; Roberts et al., 2016; Vista et al., 2010; Wells & Dumbrell, 2006). Adequate nutritional intake is a main concern among those RLWD who face eating challenges at mealtimes (Bell et al., 2013). These challenges are primarily described in the literature from a biomedical standpoint: care providers are motivated to address nutritional intake due to apprehensiveness that the RLWD may become malnourished, resulting in an increased risk of physical illness and death (Manthorpe & Watson, 2003).

Malnutrition is a serious, ongoing concern and has been found to affect anywhere between 44% to 61% of LTC residents (Bell et al., 2013; Keller et al., 2017a). Malnourished residents are more likely to experience readmission to hospital, functional

and cognitive decline, increased morbidity and mortality (Neyens et al., 2013; Wirth et al., 2016). To ensure that RLWD maintain an appropriate weight and nutritional status, eating challenges are often circumvented by using unsatisfactory solutions, such as oral nutritional supplements (Allen et al., 2013). There is strong evidence that indicates both the social and physical dining environments play a critical role in supporting the mealtime experience for RLWD with eating challenges (Harnett & Jönson, 2017; Hung & Chaudhury, 2011; Lowndes, Armstrong & Daly, 2015; Slaughter et al., 2020; Watkins et al., 2017) and may influence their food consumption (Charras & Frémontier, 2010; Keller et al., 2017a). However, little attention has been given to understanding the home, staff, and resident factors that can impact the social side of meals. Further, several interventions have focused on eating assistance for RLWD (Douglas & Lawrence, 2015; Liu et al., 2015), employing strategies such as graduated physical assistance (Simmons & Schnelle, 2004), interval verbal prompting (Coyne & Hoskins, 1997), and hand-over-hand techniques (Batchelor-Murphy et al., 2017; Chang et al., 2006). Many of these studies report mixed findings and few acknowledge the importance of the relationship or dynamic between the person being assisted and the person assisting, including instances of negative prompting methods (e.g., Durkin et al., 2014; Liu et al., 2020b; Palese et al., 2019a). Family involvement in providing eating assistance and how this compares to staff is specifically absent in the literature. Moreover, many of the interventions put into place to support food intake fail to account for sensory loss (e.g., vision and hearing) and verbal communication impairments that can impact eating and make mealtime social interactions particularly challenging (Dev et al., 2014; McCreedy et al., 2018; Punch et al., 2019).

The uptake and sustainment of such LTC interventions, in addition to everyday care practices, is affected by context (Berta et al., 2019); the extent to which social and medical care is balanced within a home is indicative of interacting meso- and macro-level factors that contribute to the conditions of care (Armstrong, 2018). For example, how care is practiced and organized (Baines & Armstrong, 2018), the physical design of homes (Chaudhury et al., 2017), ownership models (Daly, 2015), funding structures (Harrington et al., 2015, 2017), and other socio-political factors within the LTC sector

play a part in forming working conditions and thus the ability for staff to provide certain types of care (e.g., Daly & Lewis, 2000). Staffing levels are often used as indicators of quality of care in the LTC sector. However, a recent literature review examining the associations between nursing staff coverage, direct care hours, and quality of care in LTC homes found that evidence of associations were inconsistent and of low-quality (Armijo-Olivo et al., 2020). It was found that the majority of recent research published used US data and did not account for other contextual confounding variables such as resident and facility characteristics (Armijo-Olivo et al., 2020). Further, studies reviewed adopted medical outcomes of interest such as falls, pain management, and pressure ulcers, and did not include variables related to the provision of social care, level/type of continued family caregiving, resident nutrition or mealtime experiences beyond weight loss and dehydration (Armijo-Olivo et al., 2020). Currently we are limited in our understanding of which meso- and macro-level factors directly and/or indirectly impact the conditions of care, the mealtime experience, family mealtime involvement, and resident nutrition status. There is a need to examine these relationships from a Canadian perspective using a comprehensive approach.

Considering Douglas's deciphering of 'The Meal', there is a pressing need to close the "distance" and create mealtimes in LTC homes that are intimate, ones that are supportive, and ones that can help "express close friendship" among those who live, work, and spend time with loved ones in these spaces (Douglas, 1975, p.41). This dissertation is comprised of three distinct secondary data analyses that work to provide a deeper understanding of how multi-level factors interact to shape the conditions within the types of mealtime experiences, and specifically how mealtime care is provided by staff, the impact of family mealtime involvement on food intake, and how sensory and other communication challenges are associated with resident nutrition status. This dissertation would not be possible without the rigorous, comprehensive Making the Most of Mealtimes (M3) Study dataset. The M3 Study was a seminal cross-sectional study that examined multi-level factors associated with resident food and fluid intake across 32 Canadian LTC homes in four provinces (Alberta, Manitoba, Ontario, and New Brunswick) using several data sources that provided a comprehensive examination into

meal quality, meal access, and the mealtime experience within these homes. This comprehensive data set provides the first opportunity to better understand multi-level factors, mealtime experience, and food intake.

This dissertation is paper based; one paper has been published and the remaining two have been submitted for publication. Chapter 2 provides an overarching review of the literature pertinent to all three studies. Chapter 3 outlines the research questions and hypotheses for each study. Chapter 4 (Part 1) is focused on identifying the multi-level factors that are associated with staff's provision of mealtime care, and specifically RCC and TF mealtime practices. Chapter 5 (Part 2) examines the independent association of family member eating assistance on food intake for those residents requiring this physical support. Chapter 6 (Part 3) explores the associations between sensory impairments, communication challenges, wayfaring, and staff and family mealtime interactions with resident nutrition status. An overall discussion in Chapter 7 contextualizes key findings from these studies and identifies implications for future research. Chapter 8 concludes this dissertation.

Chapter 2: Literature Review

2.1 The Meaning of Mealtimes in Long-Term Care

The taking of food is necessary from a social perspective, as well as a biological one. Each meal carries with it nutritional value for the functioning of the body, as well as the symbolic significance of other meals (Douglas, 1975): why one eats, what one eats, how one eats, and with whom one eats, is imbued with implications of past and present. Food is "a prime constituent of social relations" (Douglas & Gross, 1981, p.1). It regulates relationships (e.g., solidarity, community), it is a pawn both within the household (e.g., gender) and political stratums (e.g., power and powerlessness), and is a focal point and foundation in almost every culture (Counihan & Van Esterik, 1997). For these reasons, one could argue that our understanding of the social and biological motivations surrounding food cannot be uncoupled. To speak of and understand food, therefore, we must acknowledge the significant value it holds for an individual's well-being throughout their life course (Devine, 2005; Evans et al., 2005; Falk et al., 1996).

The experience an older person has with food and eating within a LTC home typically does not reflect lifelong patterns established prior to entering this formal care context. If we consider Douglas's efforts to decipher 'The Meal', we understand that a meal's meaning is suspended within a "system of repeated analogies": each meal is restructured in the image of past meals - a patterned activity (Douglas, 1975, p.36). What often is described in literature exploring meals in LTC is poor representation of the once familiar, comforting, and ritualistic pattern (Henkusens et al., 2014; Hung & Chaudhury, 2011; Manthorpe & Watson, 2003; Milte et al., 2017; Petersen et al., 2016). As a result of the institutional environment, residents are forced to engage in daily food and eating rituals that do not resemble meals past, and by having to do so, simultaneously disrupt a critical means of social expression and social connection.

Qualitative studies that have examined life in LTC, in particular ethnographies or observational studies, often make direct or indirect mention of frustrations surrounding

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mealtimes and the influence they have on resident identity, relationships, and quality of life (den Ouden et al., 2015; Henkusens et al., 2014; Jaye et al., 2016; Tsai et al., 2020; Watkins et al., 2017). Findings from these studies describe the deep and resounding impact that mealtimes have on residents, regardless of whether they had recently moved into an LTC home or had resided there for a considerable time (Henkusens et al., 2014). Literature indicates a modification in a meal's purpose and meaning, mirroring the transformation the resident themselves undergoes as they struggle with maintaining their autonomy, identity, and social connectedness within a highly regulated institutional setting (Hung & Chaudhury, 2011; Goffman, 1962; Lowdnes et al., 2015; Milte et al., 2017; Savishinksy, 2003). A longitudinal study conducted by Henkusens and colleagues (2014) describes the immediate renegotiating of food and food roles that RLWD and their families engage in shortly after entering into a LTC or retirement home. Both residents and their families note the stark contrast between relationship-focused meals they experienced at home versus the overly systematized eating experiences in LTC (Henkusens et al., 2014). In a more recent study conducted by Harnett and Jöhnson (2017), mealtimes in Swedish care homes took on an almost theatre-like demeanor, where resident and care staff attempted to create "appropriate versions" of family-style meals in front of an institutional-dominant backdrop. In this study, genuine efforts by care staff to personalize the meal experience were overtaken for the need for efficiency and control in this setting (Harnett & Jöhnson, 2017).

Although the meaning of mealtimes may have changed for residents, they continue to function as a symbol of normalcy, a temporal marker, and the social focal point for those who live and work in LTC (Barnes et al., 2013; Bennett et al., 2014; Bundgaard, 2005; Campo & Chaudhury, 2012; Palacios-Ceña et al., 2013). In fact, the social exchange afforded by meals was seen by residents and care staff as outweighing the nutritional needs in some cases (Bennett et al., 2014). Research indicates that staff understand the role mealtimes play in residents' quality of life and as a contributor to the broader "social fabric" of the home (Kofod & Birkemose, 2004). At the same time, staff show considerable empathy for residents who struggle to maintain identity through limited food options (Palacios-Cena et al., 2013), loss of agency around dining preferences

(Amella, 2002), and dignity associated with eating challenges (Bennett et al., 2014). Mealtimes are a central component to the communities within LTC homes and are a key aspect of resident's quality of life. Yet, our understanding of how multi-level factors of resident capacity (e.g., eating assistance, communication, vision and hearing impairments, wayfaring), staff mealtime care practices, and family mealtime involvement interact and impact residents' nutritional status is limited.

2.2 A Brief Overview of Culture Change in Long-Term Care: A Way Forward with Relational and Relationship Centered Mealtimes

Almost five decades ago, a culture change movement began in the residential care sector that represented a fundamental shift in the way residential homes, such as LTC, were conceptualized. A broad-based effort was made by consumer advocacy groups, providers, and policy makers to transform LTC homes from a traditionally biomedical institutional model, to ones that – initially - advocated for the adoption of a 'person-centered model' (Koren, 2010). The movement would place the following 'person-centered' values at the forefront of an 'ideal' LTC environment: 1) resident directed; 2) homelike atmosphere; 3) close relationships; 4) staff empowerment; 5) collaborative decisions making; and 6) quality-improvement processes (Koren, 2010). The early years of this culture change movement took place simultaneously in the United States (US) and the United Kingdom (UK). This parallel development resulted in significant ambiguity within academic and policy discourses around the definition and concept of person-centered care (PCC), and how they were to be interpreted and applied during care delivery: "it means different things to different people in different contexts" (Brooker, 2003, p.216). In the UK, Tom Kitwood's work on PCC was grounded within the field of dementia care, where he defined a person's "personhood" as "a standing or status that is bestowed upon one human being, by others" (Kitwood, 1997, p.8), and that by providing PCC, others could preserve the person living with dementia's personhood through meaningful relationships. Kitwood's contributions were disruptive and revolutionary at the time and aligned with the greater evolution occurring within the North American LTC sector. Kitwood's version of PCC actively situated the person living

with dementia with his/her complex social network and socio-cultural background; that is, Kitwood's iteration of PCC was viewed through a relational lens (i.e., individual's capacity for autonomy is relative to their relationship with other individuals, systems, and structures). The adoption of PCC in the US was promoted through such initiatives as The Eden Alternative and The Pioneer Network (Fagan, 2003), where PCC values included equality, social justice, and particularly the importance of individual choice (Graham, 2017; Rahman & Simmons, 2014).

As Koren (2010) notes in her critical discussion of culture change within nursing homes, the adoption of PCC values was irresolute at best during the early 2000's. Recognition of the term was widespread, however, many homes were not able to implement culture change practices for various reasons, including restrictions in workforce, funding, regulations, and lack of dedicated leadership (Koren, 2010). Perhaps one of the biggest challenges facing administrators and care staff was how PCC was to be enacted in day-to-day routines, such as during the mealtime. Researchers like Reimer and Keller (2009) attempted to bring pragmatism and clarity to care providers by delineating what PCC encompassed, in this case, at mealtimes: 1) promoting of social interactions, 2) providing food choices and preferences, 3) supporting independent eating, and 4) showing respect throughout services and assistance (Reimer & Keller, 2009). Yet, even with a practical application of this model of care, the authors ultimately came to a similar conclusion: if these same contextual factors that Koren (2010) made reference to were not addressed, efforts to create person-centered mealtime experiences would continue to be an inefficacious endeavour (Reimer & Keller, 2009).

Still, there were those who disagreed with the fundamental basis of this culture change movement and argued that PCC was ultimately neither helpful, practical, nor achievable (McCormack, 2001; Nolan et al., 2004). Nolan and colleagues (2004) and McCormack (2001) were some of the earliest theorists to criticize the overemphasis on the individuality of care and claimed that the underscoring of autonomy in this case was a masked effort to promote neo-liberal consumerist values in geriatric care (i.e., health care that promotes consumerism through overemphasizing individuality, independence, and autonomy). Further to this, McCormack (2001) argued that the concepts of

individuality and independence that is promoted under the philosophy of PCC cannot be fully realized within the context of health care for older people; that in fact, it is interdependence itself and our interactions and relationships with others that shapes our lives as we interpret and construct our subjective worlds (Adams & Gardiner, 2005; Nolan, Davies, Brown, Keady & Nolan, 2004). Instead, these theorists offered the similar yet distinct philosophy of 'relationship-centred care' (RCC) (Adams & Gardiner, 2005), defined as care that emphasizes the centrality of relationships as "the foundation of any therapeutic or healing activity" (Tresolini et al., 1994, p.22). This philosophy embraces a reciprocal idea of caring, that older adults living within LTC settings give as well as receive, and that this reciprocity extends beyond care staff and resident to include family members, staff from all disciplines within the home, and those living in the wider community (Adams & Gardiner, 2005; Nolan et al., 2004). Further to this, one may consider PCC to be an embedded aspect within an RCC philosophy. While Nolan and colleagues (2004) remain dedicated in their view that respecting personhood is essential, they argue that ultimately human beings are relational in their belonging to an interdependent social network and find RCC to be more accurate and utilitarian in capturing this complexity. Thus, the ability for a home to respect and support a resident's individual needs and preferences (i.e., PCC practices) is interdependent with the quality of their relationships with staff and the ability for staff to provide this type of care (i.e., RCC practices).

Akin to the philosophy of RCC is relational theory, which is often applied by feminist scholars within the practice of law and health care ethics, addresses an individual's particular situation or concern by accounting for their community of relationships (MacDonald, 2007; Nedelsky, 2011). Relational theory is understood in this dissertation as a framework that makes explicit the reality of interacting layers of interdependence an individual experiences and the centrality of relationships as part of the of ongoing development of the human self (Downie & Llewellyn, 2012; Sherwin & Winsby, 2010). As such, relational theory challenges traditional Western notions of autonomy that posits individuals as living self-determined lives - ideally independent from potential controlling influences, when in reality individuals are rarely fully independent and their

identities and interests are influenced by the relationships around them (Dove et al., 2017). That is to say, *relational* autonomy requires consideration for the range of barriers to autonomous choice and the social conditions and relationships that capacitates an individual's identity formation and self-determination (Dove et al., 2017; Sherwin & Winsby, 2010; Nedelsky, 2011). However, unlike the RCC philosophy, relational theory widens the scope of these relationships to include ties to social (e.g., gender, race, ethnicity, culture, family history), economic (e.g., welfare, capitalistic), and governmental (e.g., political, legal) structures; thus "each set of relations is nested in the next, and all interact with each other" (Nedelsky, 2011, p.31). It is through the relationships between and within these nested structures that an individual's relational autonomy may thrive or become undermined; the capacity for autonomy *is made possible by* constructive relationships (Nedelsky, 2011). Relational theory is used in this dissertation as a way to interpret the events of mealtimes (e.g., social interactions, food intake, eating assistance) within LTC homes as relational interactions between individuals and larger systems and structures, and aids in the understanding of these complex problems and constituting solutions (Nedelsky, 2011). The enactment of valuing social connections in formal care settings, however, is exercised through RCC practices.

By adopting a relational approach to both research and the culture change discourse, the context within which care is provided is brought closer to the forefront (i.e., the constitutive view of relational autonomy; Nedelsky, 2011). The current dissertation is informed by relational theory in order to better contextualize the relationships of those who live and work in these homes, the impact of family participation in mealtimes, and the implications that these relationships have on a resident's nutritional status. Relational theory is particularly pertinent to the interpretation of these issues as residents', staff, and family members' autonomy are highly restricted by the very nature of living in, working in, and visiting institutions (e.g., Watson, 1994). By framing an individual's identity, choices, needs, and preferences as interdependent on their social conditions, we may then begin to consider the peripheral yet relevant systems and

structures that result in not only discrepancies in the quality of care but the very ability to provide good care in the first place.

Figure 2.1 presents a proposed relational model of mealtimes within a dining room in a Canadian LTC home. At the centre of the model is the interdependent relationship between four groups who are commonly present: resident, other residents, staff, and family/volunteers. These four groups interact with one another for various reasons, however, resident food intake, nutrition status and the mealtime experience are key outcomes from these mealtime interactions. In this dissertation, factors that would impact these interactions were captured through resident characteristics and interactions (e.g., dementia, oral health, required physical eating assistance, socialization with tablemates), staff mealtime care (i.e., relationship-centred (RCC) and task-focused (TF practices), and family food involvement (i.e., providing eating assistance, bringing food for the resident). These relationships are nested within the larger social dining environment, which is understood as psychosocial elements to the mealtime experience that impact how, why, and when these interactions take place. In this work, the social dining environment was captured through such variables as the number of staff in the dining room during observations or the ratio of residents-to-staff involved direct meal care (i.e., eating assistance).
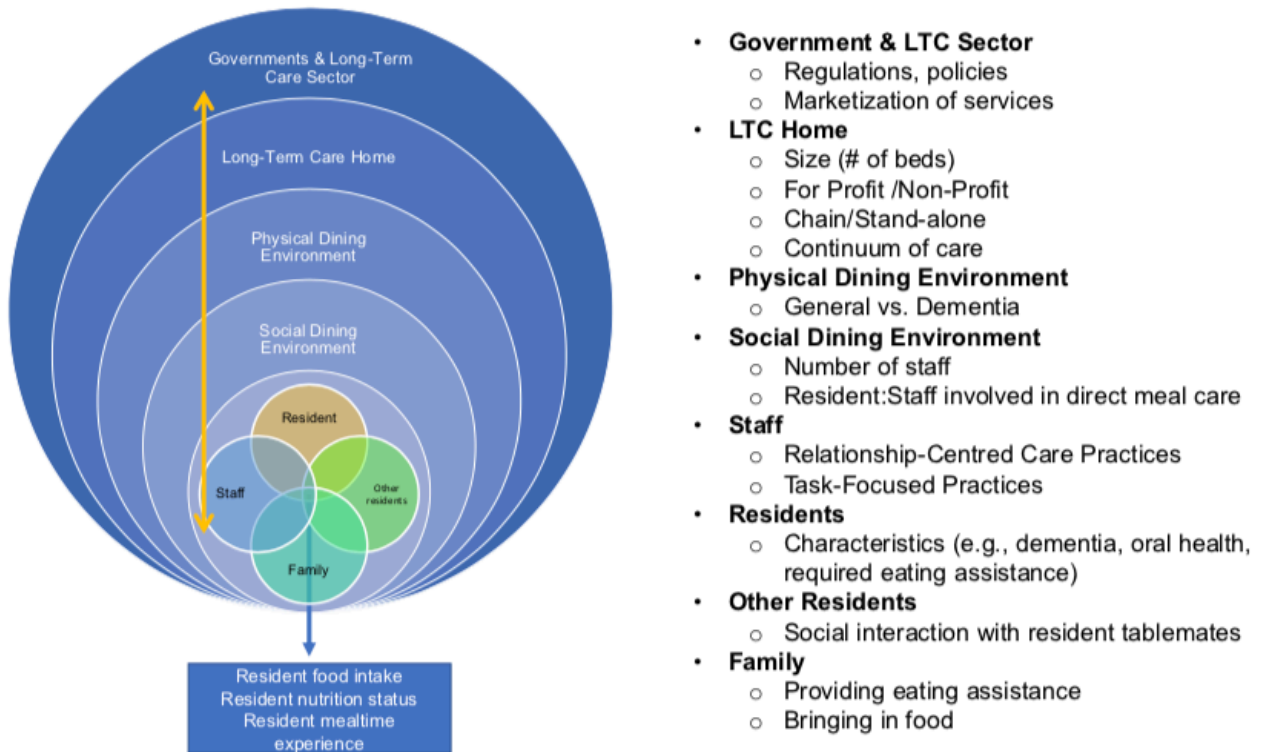
Figure 2.1. A proposed relational model of mealtimes within Canadian Long-Term Care

This level is nested within the physical dining environment that was examined in this current research by differentiating between dining rooms in general home areas (i.e., care units) and those situated within spaces specifically constructed to support those living with dementia. Specialized dementia care spaces are typically designed to maximize RLWD's autonomy, physical functioning, and well-being, in addition to specialized dementia care training for staff, whereas general home areas have historically put less emphasis on these factors. The physical dining environment is then considered within the larger context of the LTC home itself, factoring in variables such as the size of the home and for-profit or non-profit ownership. Such factors would determine the size of dining rooms and staffing levels, for example. Finally, the LTC home itself operates within a system of government regulations, policies, and economic drivers (e.g., marketization of services) that impacts all nested levels within this model, including the innermost interactions between staff, residents, and families. This model takes into consideration the variability in which the characteristics of each nest combine

in different ways, resulting in different mealtime experiences and resident food intake and nutrition status outcomes, as denoted by the yellow arrow. This proposed relational model of mealtimes provides a way to explore within and between each nested level, thus providing the opportunity to consider how these conditions of care might be modified through intervention work. It should be noted that the extent to which this body of work is able to explore the relational aspects of each level of this nested structure is limited by the nature of secondary data analyses; however, the comprehensiveness of the M3 Study dataset and the rigour through which these data were collected is unparalleled within Canada and beyond and allows for a form of scholarly interpretation.

2.3 Contrasting Relationships to Tasks: Systematizing Meals in Long-Term Care

We cannot discuss the meaning of mealtimes without highlighting multi-level influences that impact the innermost mealtime interactions within LTC homes. There is a growing body of evidence that demonstrates the relational effect of austerity measures by governments, the privatization of care, paired with increasingly complex resident care needs that has resulted in the systemization of mealtimes and negative consequences for social care (Armstrong, 2018; Huang & Bowblis, 2018; Lowndes et al., 2015; Lowndes et al., 2015).

The socio-ecological framework employed by Keller and colleagues (2014) in their study on the prevalence and determinants of food intake among Canadian LTC residents is an excellent example of the importance of accounting for the influence of factors at the resident-, home-, and government-level on mealtimes and resident food intake (Keller et al., 2014; Figure 4.1). By applying this multi-level conceptual framework to their study, Keller and colleagues (2017a) found that residents' food intake were impacted at every level of the care context, including individual resident characteristics (e.g., eating challenges), staff mealtime care practices, being on a dementia home area, as well as access to a registered dietitian – all of which are consequences of the home's organizational culture, policies, regulations, and funding set out by the provincial and

federal governments (e.g., Long Term Care Homes Act (LTCHA), 2007). The following sections further discuss resident, staff, dining room and home and systematic factors that impact the mealtime experience in LTC.

2.3.1 Resident factors that impact food intake and mealtime experience

Mealtimes play an important role in residents' well-being and quality of life, however, their ability to participate and benefit from the commensal dining experience is dependent upon a combination of individual and contextual factors. Increase in age is typically accompanied by degenerative changes that impact a person's social, physical, and cognitive functions. Multiple chronic impairments, paired with polypharmacy (9 or more prescription medications administered concurrently), can lead to inadequate nutritional intake, accelerating the progression of chronic impairments and decreased function (Fávaro-Moreira et al., 2016; Volkert et al., 2019). RLWD typically experience changes to their memory and senses (e.g., vision, hearing, taste, smell, and touch) that can impact their abilities and desire to eat (Loughrey et al., 2018; Roberts et al., 2016), making them especially suspectable to malnutrition (Volkert et al., 2015). Memories related to recognizing foods and actions associated with eating can make mealtimes difficult and stressful for the RLWD, as well as staff and those seated around them in the dining room (Loughrey et al., 2018). Psychosocial and physiological implications related to dysphagia, communication and sensory challenges, and difficulties self-feeding can have negative impacts on residents' well-being and self-esteem, particularly in group dining settings (Ballard et al., 2001; Ekberg et al., 2002; Pryce & Gooberman-Hill, 2012; Rabiee et al., 2021; Slaughter et al., 2011).

Sensory impairments, specifically hearing and vision loss, have shown to increase institutionalized older adults' risk of malnutrition (Dev et al., 2014; Muurinen et al., 2014; Wells & Dumbrell, 2006). Hearing loss affects up to 80% of residents (McCreedy et al., 2018) and vision impairment impacts 30-57% of residents (Dev et al., 2014; Monaco et al., 2020), though these numbers are most likely higher due to poor assessment and management in LTC homes (Andrusjak et al., 2020). Sensory impairments have been

shown to exacerbate cognitive-communication disabilities among RLWD by reducing the capacity to distinguish between speech and excess noise, particularly in busy communal areas of LTC homes such as dining rooms (McCreedy et al., 2018; Punch et al., 2019). Additional issues arise when wayfaring residents (i.e., "wandering" tendencies) (Graham, 2017), who are at increased risk of malnutrition due to additional energy expenditure, walk away from the table during mealtimes, sometimes leaving their food and drink untouched (Beattie & Algase, 2004). In addition, verbal communication may become increasingly impaired, making it hard for RLWD to express their needs and personal preferences at mealtimes, resulting in situations where they may be underfed, overfed, or unable to convey discomfort or chronic pain while eating (Milte et al., 2017; Stubbs et al., 2016). Research to date often examines these challenges independent of each other, as well as other factors that can impact food intake and nutritional status.

Neuromuscular changes associated with dementia can make swallowing certain foods difficult or unsafe (Edahiro et al., 2012; Namasivayam-MacDonald, Morrison, Steele & Keller, 2017; Vista et al., 2010). In a large Canadian study conducted by Keller and colleagues (2017a), it was found that almost 60% of residents experienced dysphagia risk (difficulty/discomfort experienced while swallowing) and close to 50% had oral health issues that would have impacted their ability to eat (Yoon et al., 2018). As a result, almost half of residents required modified textured diets and thickened fluids in order to prevent choking and chewing discomfort (Vucea et al., 2019). RLWD often experience challenges in their abilities to perform activities of daily living (ADL), however, certain activities become increasingly more challenging as their dementia progresses, including the ability to eat independently (Dunne et al., 2004; Giebel et al., 2015). Towards the end of the dementia progression, the need for eating assistance increases where upwards of 70% of RLWD will experience eating challenges associated with neurological and visuomotor changes (Abdelhamid et al., 2016; Keller et al., 2017a; Namasivayam-MacDonald et al., 2018; Slaughter, Eliasziw et al., 2011). The impaired mechanisms associated with eating challenges can include apraxia or visuospatial dysfunctions that impact the coordination of eating movements, dysphagia

which can cause food avoidance, responsive behaviours as a result of communication challenges and unmet needs, discomfort while eating, and memory issues that can make recalling the steps involved in eating too laborious (Giebel et al., 2015; Jung et al., 2021; Neumann et al., 2001; Njegovan, Man-Son-Hing, Mitchell & Molnar, 2001; Tippett & Sergio, 2006). Such eating challenges can present as needing physical help with maneuvering food onto a utensil and into the mouth (i.e., eating performance), needing support through verbal cuing, spitting out food, and/or refusing to eat, which may be distressing for the person assisting as well as other residents at the table (Volicer et al., 1989; Watson, 1993). These issues have been used to paint a general picture of eating challenges among those living with dementia, however, there remains considerable variability in the range of difficulties faced by those living with dementia (Manthorpe & Watson, 2003).

For many residents in LTC, mealtimes are a source of anxiety that requires additional physically and emotional labour (Watkins et al., 2017) that can result in compromised nutritional status (Keller et al., 2017a). For this reason, it is necessary to consider the position of those residents on the receiving end of eating assistance. As will be discussed, the degree to which an individual resident experiences the easing or intensification of eating challenges and the opportunity to enjoy the mealtime experience is in direct relation to the context of care, making it essential that adequate mealtime care is provided for residents who face these specific challenges. Based on current evidence, both in prevalence and intervention studies, there remains considerable room to understand and address factors related to the social (e.g., RCC practices, family involvement) and physical dining environments that can either ease or compound resident mealtime difficulties.

2.3.2 The Context of Caring: Staff balancing relationship-centred and task-focused mealtime practices

The culture change movement of the last several decades has centred around improving the quality of care of residents, termed as "resident-centred" or "person-

centred" approaches to care provision. As discussed previously, the focus on the care recipient's needs and preferences within the context of Canadian LTC is unrealistic for two main reasons: 1) the extent to which a resident can exercise choice and autonomy is based on regulations and policies that limit the ability for staff to provide "person-centred care", and 2) that a precondition for staff to be able to enact "person-centred care" is a work environment that supports this type of care (Baines & Armstrong, 2018; McCormack, 2001; Maluf et al., 2020; Nolan et al., 2004). Research that examines the provision of mealtime care in particular within North America, describes it as highly regulated and rushed, with little room for meaningful socialization between residents, staff, or families (Hung & Chaudhury, 2011; Lowndes et al., 2015; Lowndes et al., 2018). Understaffing, regulations, resident complex care needs, and limited time means that staff must be efficient and expedite mealtime processes in a standardized way (Bennett et al., 2014). Processes that are deemed essential, such as serving food, administering medications, ensuring adequate food intake via eating assistance, documenting food intake, and clearing dishes, then become the priority of mealtimes, resulting in task-focused practices and poor mealtime experiences. Findings from an ethnography conducted by Hung and Chaudhury (2011) describe a RLWD feeling distressed because staff were ignoring her mealtime requests and did not give her adequate time to communicate her needs. In the most extreme cases of task-focused practices, staff have been observed resorting to intimidation tactics and force-feeding to reach adequate nutritional intake (Palese et al., 2019a). Not only do task-focused practices undermine the relational autonomy of residents by reducing their opportunities to participate in mealtime activities, exercise agency (e.g., when to eat, what to eat) or maintain their dignity, it also compromises the relational autonomy of staff (Sherwin & Winsby, 2010).

Enacting RCC practices or any form of social care during mealtimes requires that staff be able to apply their best clinical judgement as it relates to the needs of a specific resident, at a (slower) pace that allows for clear communication and meaningful connection, especially for RLWD (Adams and Gardiner, 2005; Faraday et al., 2019). The extent to which staff are able to balance RCC practices and TF practices is a direct

reflection of the context of care, including worker education, attitudes, regulation, organizational culture and expectations, and other physical and social factors (Armstrong, 2018). Care staff (i.e., Personal Support Workers / Care Aides) provide between 75 to 90% of direct care (Estabrooks et al., 2015a; Estabrooks et al., 2015b), making this relationship one of the most important quality of life factors for residents (Kehyayan et al., 2015). Middle-aged racialized women, many of whom born outside of Canada, are highly overrepresented within the LTC workforce (Chamberlain et al., 2016; Chamberlain et al., 2018). Direct care and social care are often devalued and defined as unskilled, largely in part because these tacit knowledge skills are not easily measurable and have historically been viewed as "domestic" work (Barken & Armstrong, 2018). This workforce, despite providing the most care to residents, has the lowest level of education and salary, and the least relational autonomy within this care context (Andersen, 2009; Caspar et al., 2016). Staff recognize the need to upgrade their skills in order to attend to the increasingly complex care needs of residents (Andersen, 2009), however, there are currently no nationally recognized education standards for this workforce in Canada and training varies across provinces (Association of Canadian Community Colleges, 2012).

Viewing direct care staff work as 'lesser than' has no doubt helped to perpetuate working conditions that have resulted in emotional exhaustion and cynicism among workers (Chamberlain et al., 2017). Research has demonstrated that organizational context, specifically home leadership, social capital, and the home's ability to respond to internal and external pressures is significantly associated with staff job satisfaction (Chamberlain et al., 2016; Squires et al., 2015). Instances where staff have felt a lack of support from home leadership and colleagues (Kuo et al., 2008; McGilton et al., 2020) or a lack of decision-making capacity (Guadenz et al., 2019: Parsons et al., 2003) can result in lower quality of care, and ultimately lead to a reduced LTC workforce (Bowers et al., 2003). Conversely, Song and colleagues (2020) reported that staff working in home areas that supported their social capital had significantly fewer missed essential care tasks, such as eating assistance. Despite evidence of modifiable factors that could

improve working conditions for LTC staff, recent research suggests that little has been done to improve the quality of work life for this group (Chamberlain et al., 2018).

2.3.3 Reinforcing Systematized Meals through the Physical Dining Environment

Over the past several decades, there has been a growing body of literature that has identified the impact that unsupportive physical environments (for example, traditional institutional care environments) can have on the health, quality of life, and well-being of those living with dementia. Within LTC facilities, such environments can result in RLWD becoming socially withdrawn, agitated, disoriented, anxious, and increasingly dependent on assistance with ADL (Chaudhury & Cooke, 2014; Chaudhury et al., 2013; Davis, Byers, Nay & Koch, 2009). Specific characteristics of unsupportive LTC environments include large nursing home units (i.e., 30 or more residents) where high traffic and more frequent territorial conflicts can cause greater intellectual deterioration and emotional stress (Morgan & Stewart, 1998; Sloane et al., 1998). Similarly, environments that promote sensory overload from unnatural and/or poor lighting (Ancoli-Israel et al. 2003; Day et al., 2000; Fetveit and Bjorvatn 2005; Thorpe, Middleton, Russell & Stewart, 2000; Rabiee et al., 2021) and loud, excess noise levels (e.g., call bells, loud televisions, alarms, etc.) (Garre-Olmo et al., 2012; Joosse, 2012) can exacerbate sensory changes in RLWD, making it challenging for them to interact socially and independently navigate their surroundings. Finally, spaces that lack homelike characteristics (e.g., bookcases, large windows, wall décor, paintings, upholstered sofas) have been found to promote exit-seeking among RLWD, as well as prompted verbal aggression and agitation (Annerstedt 1994; McAllister and Silverman 1999; Wilkes et al. 2005).

Dining areas have received considerable attention within the environmental design discourse in regard to their composition and layout, as dining rooms are a shared space and are important to the physical and psychosocial health of residents (Amella, 2002; Campo & Chaudhury 2012; Hung & Chaudhury, 2013; Slaughter, Eliasziw, Morgan & Drummond, 2011; Keller et al., 2017a; Manthorpe & Watson, 2003; Milte et al., 2017).

Only recently have researchers studying malnutrition in LTC started to move away from solely attributing eating challenges and malnutrition to symptoms of dementia and have begun to consider and address the impact of the built environment on a resident's dining experience (Aselage, 2010; Bakker, 2003; Slaughter et al., 2011. Chaudhury and colleagues (2013; 2017) have identified seven design aspects of supportive dining environments: (1) promoting resident functional ability (e.g., supporting cognitive and sensory changes), (2) maximizing orientation (e.g., way-fining to locate dining room, sensory cues to stimulate appetite), (3) providing residents with a sense of security and safety (e.g., reducing clutter to better accommodate residents' movements), (4) homelike décor to promote familiarity of eating space (e.g., family-style food service, colourful décor), (5) providing appropriate sensory stimulation (e.g., creating ambiance through relaxing music), (6) creating opportunities for social interaction and connection (e.g., variety of seating arrangements in smaller dining spaces), and (7) ensuring that residents have privacy and feel a sense of personal control over their meals (e.g., staff are educated on person-centred or relationship-centred mealtime care to support safe and independent eating experiences). As identified by Slaughter and colleagues (2020) environments that do not incorporate these design elements and are either over- or under-stimulating, have the capacity to cause RLWD to experience distress confusion, frustration and agitation, in addition to increasing instances of excess eating disability. On the other hand, supportive physical dining environments have been shown to be associated with increased energy intake among residents (Slaughter et al., 2020). It is important to note that enjoyable mealtime experiences are subjective to RLWD, and that how they experience their food and mealtimes will change over time, and in some cases, will differ from meal to meal (Aselage, 2010; Bakker, 2003). Interestingly, in a study examining prevalence and determinants of food intake among residents in Canadian LTC homes, the homelikeness of the physical environment was inversely related to nutritional intake among this population indicating that the impact of a supportive dining space may only be fully realized when this space is met with congruency in staff care practices and LTC home culture and policies (Keller et al., 2017a).

A deeper understanding of the interaction between physical spaces and care practices are needed; however, a handful of qualitative research studies provide accounts that capture the nuances of staff and residents navigating these built environments (Chaudhury et al., 2017; Chaudhury et al., 2018; Lee et al., 2021). Lowndes and colleagues (2018) created comparison dining maps between dining spaces in four LTC homes located in Germany (2 homes), Norway, and Canada (Ontario) that capture such factors as resident seating arrangements, resident eating assistance, the proximity of dining tables to one another and to serveries, and how staff move around these rooms during meals. The dining rooms in the Canadian LTC home were by far the largest out of the other participating homes and exhibited considerable, crowded spaces where staff movement was tracked as a constant start/stop of task-based practices in order to juggle multiple residents' needs and complete mealtime duties (Lowndes et al., 2018). Further, this home kept kitchen spaces and refrigerators locked, preventing residents to engage in familiar mealtime rituals and further increasing dependency within an understaffed home (Lowndes et al., 2018). Conversely, studies that have examined dining room improvements (e.g., open severy kitchen for resident use, contemporary light fixtures, wooden-look flooring, homelike décor) indicate that residents' ability to navigate the environment improved resident autonomy and personal control, which translated into increased amount of time staff had to provide personalized care, thus working more effectively as a team (Chaudhury et al., 2017).

The link between RLWD's well-being through their experience of the surroundings is imperative to creating mealtime experiences that are pleasurable. Yet, researchers in this field note that there remains a scarcity of literature examining how these dining environments are designed in ways that are responsive to the needs and traditions of ethno-culturally diverse groups living in LTC homes (Chaudhury et al., 2013, 2017). Further, while these seven design elements identified by Chaudhury and colleagues (2013; 2017) are essential for PCC approaches, there is a need to consider how these environments can be more inclusive, essentially more "homelike" to welcome those members of important social networks who live and work outside of this care context, for example, family members. Literature examining family's perception of homelikeness of

LTC settings is scant, with only one study conducted examining the predictors of family member perceptions of homelikeness of LTC homes located in Nova Scotia (Chamberlain, Weeks & Keefe, 2017). Interestingly, families felt more "at home" in these spaces if they perceived relationships between themselves and care staff, and between residents and care staff to be positive; the physical layout of the home was found to be not significantly associated with family member perceptions' of homelikeness (Chamberlain et al., 2017). This has important implications for creating inclusive and supportive spaces within LTC homes that maximize relationship building and social opportunities, such as environments where food and socializing are fostered (Andrew & Ritchie, 2017; Barken & Lowdnes, 2018; Chamberlain et al., 2017). Further exploration of dining room factors that can impact interaction, and specifically mealtime RCC and TF practices, such as resident to staff ratio (resident:staff) and dementia focused environments is warranted.

2.3.4 Home and Policy Factors that Systematize Mealtimes

Canada's LTC sector is highly regulated by governments to ensure that homes and staff act in the best interests of vulnerable populations under their care. However, the scope to which detailed regulations have expanded, the frequency of reporting requirements, and the enforcement of these regulations targeted at individual homes impacts the relational autonomy of staff, residents, and families: staff must prioritize body care (TF practices) over social care (RCC practices), residents are further restricted in their self-determination, and involved families must navigate their positions without jeopardizing access to and care of their relatives (Figure 2.1) (Banerjee & Armstrong, 2015; Sherwin & Winsby, 2010). Theorists within this field identify a "regulatory paradox", whereby the proportion of detailed regulation and inspection does not correspond to increases in quality of care (Armstrong, 2018; Banerjee & Armstrong, 2015). A further argument could be made that the level of regulation and oversight, in fact, diminishes some aspects of care quality (e.g., Kontos et al., 2009; Lowndes et al., 2015). Consequently, questions arise around the justification for a highly regulated sector and the implications of these regulations on the process and outcomes of monitoring mealtime care, the

policies that direct mealtime processes, and the ability for families to be meaningfully involved in mealtimes within the home. Regulations directed at the individual home-level distract from the policies and systems that perpetuate the conditions in which care is provided, for example, ownership models, home size, funding structures, and staffing levels (Banerjee & Armstrong, 2015; Daly, 2015).

The focus placed on the physiological health status of residents seems to dissolve the essence of mealtimes and are instead reconstituted as task-oriented, streamlined, and highly regulated (Banerjee & Armonstrong, 2015; Hung & Chaudhury, 2011; Kontos et al., 2009). Neoliberalist ideals and regulations (e.g., LTCHA, 2007) view the provision of care – inclusive of paid care staff and unpaid family caregivers – as a commodity (Whittaker, 2009). Monitoring this commodity takes the form of a disproportionate degree of documenting care delivery, burdening staff with data entry and redirecting their attention away from opportunities for meaningful social engagement with residents (Armstrong et al., 2016; Banerjee & Armstrong, 2015; Chadoin et al., 2016). Indirect caregiving tasks take time away from direct caregiving, including at mealtimes. For example, the RAI-MDS is a compulsory 450-item standardized assessment tool administered for each resident at admission into a LTC home and quarterly thereafter and is intended to be used for resident care plans, benchmarking between LTC homes, and funding (Hawes et al., 1997). While tracking resident health information plays a role in the management of resident physical functioning, we must remember that the act of auditing the health of residents itself is not a neutral action; verifying quality of care often times promotes a certain standard that reinforces TF practices and ultimately undermines the humanity of care from its relational dimensions (Banerjee & Armstrong, 2015). In addition, the RAI-MDS does not adequately measure psychosocial well-being (Holtkamp et al., 2001) or personal preferences (Carpenter & Challis, 2003). A rapid site-switching team ethnography conducted by Lowndes and colleagues (2015) in Ontario LTC homes draws a direct connection between the impact of regulations on both residents' autonomy and compromised quality of staff mealtime care. In accordance with the LTCHA (MOHLTC, 2007, Act 68.1A and B, Act 68.2 A-D), the authors describe staff spending considerable amounts of time entering resident fluid

and dietary intake into flow charts to be able to address questions on intake on the Resident Assessment Instrument-Minimum Data Set (RAI-MDS) system (Lowdnes et al., 2015). Further, the credibility of detailed food intake documentation at meals has been questioned, as there is indication that the data recorded often overestimates what the resident has actually consumed (Simmons & Reuben, 2000). Lowndes et al. (2015) concluded that the tasks associated with mealtime regulations and the process of documentation are prioritized at the expense of the time required to build and reinforce relationships with residents and their families. Similar findings were reported by Kontos and colleagues (2009) where staff expressed frustration over documentation that overemphasized clinical aspects of care and lacked information required to fully interact with residents and provide individualized care.

Home-level policies and practices outlined in the LTCHA (MOHLTC, 2007) also directly impacts mealtime processes. Both Hung and Chaudhury (2011) and Lowndes and colleagues (2015; 2018) describe staff having to rush between residents who require eating assistance in order to finish meals within a specified time frame. Having to expedite meal service was found to be a necessity in order to meet regulatory stipulations: "no person [should] simultaneously assist more than two residents who need total assistance[3] with eating or drinking" (MOHLTC, 2007, Act, 73.2 A). Insufficient funding to provide adequate staffing of food service workers, constant documentation, large and complex workloads, and the poor care that often ensues are cited as major barriers to sufficient food and fluid intake and socially engaging meals for residents (Keller et al., 2015; Lowndes et al., 2018; Manthorpe & Watson, 2003; Simmons & Schnelle, 2006). Given the current state of mealtimes in LTC, this reinforces the argument that regulation does not equate to increases in quality of care (Banerjee & Armstrong, 2015). Keller and colleagues (2017a) reported in their study of LTC mealtimes that when staff were able to provide a person-centred mealtime experience, residents had a statistically significantly higher energy intake (Keller et al., 2017a).

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[3] Total eating assistance is when a resident is completely dependent upon another person to help them eat. It involves another person to physical assist the resident with eating, in addition to providing verbal and visual prompting to encourage adequate nutritional intake.

Thus, the focus of care needs to shift from compulsory tasks to person- and relationship-centred to benefit residents.

Mealtime polices and regulations can also harm relationships between residents, care staff, management, and family members. Care within the Ontario LTC sector is reinforced by political and economic systems to be cost effective and efficient, denoting care to be a personal responsibility rather than one seen as part of a collective responsibility and right (Banerjee & Armonstrong, 2015). Involvement of family, to supplement, to navigate the system, to be active and essential individuals in the lives of residents, is not prioritized as important but instead promoted as a passive role to be quietly negotiated within the LTC home (Baumbusch & Phinney, 2014). This approach to relationships is endorsed by the LTCHA (MOHLTC, 2007), whereby the mention of families is not recognized beyond the option of forming a Family Council or as a substitute-decision maker for relatives with cognitive impairments. The devastating outcomes of the COVID-19 pandemic response that excluded essential family caregivers or "visitors" from entering into LTC homes may be the greatest source of evidence of the long-standing failure to recognize the significant contributions that families make to the care of residents and the undervaluing of "informal" care networks within formal care spaces (Kemp, 2020; Stall et al., 2019). Families provide essential care to their relatives, such as eating assistance, out of necessity for chronic staffing shortages and increasing resident care needs (Powell et al., 2017; Shipman & Hooten, 2007; Tsai et al., 2020). The ramifications of these short-sighted measures on Canada's LTC communities will continue to be uncovered as we work to understand the experiences of residents, families, and staff, and the causes of death for thousands of residents.

The COVID-19 pandemic marks an unprecedented event within our lifetime and has disproportionately impacted those who live and work in LTC homes (Estabrooks et al., 2020). Researchers who have examined the discrepancies in COVID-19 outbreaks and deaths among staff and residents have identified many on-going systemic issues that resulted in neglect, trauma, and significant loss of life (Liu, Maxwell, Armstrong, et al.,

2020; Molinari & Pratt, 2021). The ways in which system-level factors impact staff's ability to respond to outbreaks while providing care to residents, however, is highly variable across Canada (e.g., Liu, Maxwell, Armstrong, et al., 2020; McGregor & Harrington, 2020) as each province's LTC sector varies in ownership type (proprietary, non-profit religious, non-profit lay) and jurisdiction (municipal, provincial) (Daly, 2015). For example, as compared to other provinces, Ontario's LTC sector has the most for-profit homes, 85% of which are part of a chain (versus 31% which are non-profit and municipally run standalone homes) (McGregor & Harrington, 2020). Differences in LTC home characteristics in relation to the challenges they faced while managing COVID-19 outbreaks have been linked to a number of factors, including large, older institutional buildings and low staffing levels – features of for-profit homes and corporate chain status homes (Anderson et al., 2016; Liu, Maxwell, Armstrong, et al., 2020; McGregor & Harrington, 2020; Stall et al., 2020). There has been little discussion of other structural factors related to building design that may impact care delivery conditions, such as LTC homes attached to assisted living or retirement communities versus standalone LTC homes, though this is an under researched field (Zimmerman et al., 2003). Scholarship that examines the concept of 'new public management' (i.e., applying private sector management models in the public sector), austerity measures, and the increasing marketization of the LTC sector has long since identified these same home features (i.e., for-profit, chain status) as being associated with lower staffing levels, lower hourly wages, more part-time and casual workers, higher use of private companions, and higher staff turnover as compared to non-profit homes, resulting in fewer hours of direct care and lower quality care, (Daly et al., 2015; Harrington et al., 2015, 2017; Huang & Bowblis, 2018; Liu, Maxwell, Armstrong, et al., 2020; Ronald et al., 2016). Increasing privatization measures have been observed within LTC systems globally (e.g., Harrington et al., 2015, 2017; Mercille, 2016), though little attention has been directed towards the impact of these measures on mealtimes or resident nutritional status.

Detailed analyses of the implications of the marketization of Canada's LTC sector, government mandated regulations, and administrative policies on mealtimes is beyond the scope of this current dissertation. However, accounting for aspects of these

markets, regulations, and subsequent ramifications - both intended and unintended –
provides a strong rationale for a relational backdrop needed to understand the tensions
between the systematization of meals and the ability to foster relationships between
care staff, residents, and families through mealtimes (Armstrong et al., 2016; Banerjee
& Armstrong, 2015; Kontos et al., 2009). Low-staffing levels have been identified as
leading to poor nutritional outcomes for residents in the US (Kayser-Jones & Schnell,
1997) and Hong-Kong, with positive associations found between malnourished
residents for-profit status homes (Woo et al., 2005). Gaps remain in our understanding
of how these systems and structures interact to influence mealtime processes and the
mealtime experience within a Canadian context.

2.4 Resident Poor Food Intake and Malnutrition as Relational Outcomes of
the Long-Term Care System

As discussed briefly in the previous chapter, poor food intake and consequently
malnutrition are common among residents in LTC settings (Bell et al., 2013; Keller et al.,
2017a). At the individual level, multiple factors such as acute and chronic diseases and
anorexia of aging can result in malnutrition (Morley, 2017; Thomas, 2002). The
implications of poor nutritional status and weight loss among this population are
significant, including increased falls (Neyens et al., 2013), chronic wounds and pressure
ulcers (Horn et al., 2004), decreased quality of life (Crogan & Pasvogel, 2003), and
mortality (Hanson et al., 2013). Protein-energy malnutrition, or more specifically
'starvation-related malnutrition' (i.e., pure chronic starvation without inflammation)
(Jensen et al., 2010), is also a common problem among residents and is distinguished
by unintentional weight loss, which can be reversed with adequate food and fluid intake
(Agarwal et al., 2013).

Identification is the initial step in reversing malnutrition among LTC populations,
however, due to the complexity of risk factors for poor food intake there has been a lack
of consensus around a "gold standard" measure, resulting in the marked variance in
malnutrition prevalence rates (Bell et al., 2013; Keller et al., 2017a). Keller and

colleagues (2019) compared the Mini-Nutritional Assessment Short Form (MNA-SF) (Kaiser et al., 2009), Patient-Generated Subjective Global Assessment (PG-SGA) (Jager-Wittenaar & Ottery, 2017), the Global Category Rating and the Pt-Global webtool (http://pt-global.org/?page_id=), and the interRAI Long Term Care Facility undernutrition trigger (Hirdes et al., 2008) to determine the ideal tool for determining malnutrition in LTC. The authors found that PG-SGA Global Category Rating demonstrated the best sensitivity and specificity when compared to the other tools and it accounts for a more comprehensive set of risk factors associated with poor food intake, including its ability to detect dysphagia risk (Keller et al., 2019). When using the PG-SGA, malnutrition was determined to be 44% in LTC residents (Keller et al., 2019).

Dysphagia is a known risk factor for poor food intake and malnutrition and is commonly associated with a diagnosis of dementia and eating challenges (Namasivayam-MacDonald et al., 2017; Sura et al., 2012). Modified texture diets are frequently prescribed to manage dysphagia among residents by altering food textures (e.g., minced, pureed) in order to ease chewing and swallowing difficulties (Ballesteros-Pomar et al., 2020). Concerns around the nutritional quality of modified texture diets, in particular pureed foods containing lower amounts nutrients, have been raised as possible contributors to malnutrition risk (Dahl et al., 2007; Vucea et al., 2017). A study by Vucea and colleagues (2018) found that modified texture diets were associated with malnutrition risk when covariates associated with modified diets were considered (e.g., cognitive impairment, eating challenges, poor oral health), thus confirming that dysphagia risk alone does not predict malnutrition. This is an important finding, as it affirms that the aetiology of starvation-related malnutrition is multifactorial, and thus amenable to intervention, and that diet served is partially at fault. At the same time, this finding also demonstrates that those who experience the most eating challenges are most likely to be at risk of malnutrition. Beyond these key risk factors of cognitive impairment, eating ability and dysphagia for poor food intake, there has been little consideration for other resident characteristics that may contribute to malnutrition. For instance, poor vision and hearing loss have been shown to be associated with weight loss and poor food intake via decreased functionality (Wells & Dumbrell, 2006) and also

can result in social anxiety around eating with others (Rabiee et al., 2021). There is little to no current research that examines the prevalence and complex relationship between sensory impairments, social interactions, and malnutrition among LTC populations (Leroi, 2020), leaving minimal direction on how to support these residents at mealtimes and prevent malnutrition.

Recommendations aimed at preventing and treating malnutrition are generally directed at the individual LTC home level, for example, using MDS data to identify nutritionally vulnerable residents for intervention (Tamura et al., 2013). Beyond identifying the early stages or the resident's risks associated with malnutrition, there has been little consideration of multi-level factors that can perpetuate malnutrition, such as funding provided for food costs, the length of dining service, or the homelikeness of the dining room that will support residents to stay at the table and consume their meals. Not surprisingly, oral nutritional supplementation is a commonly used treatment (Abdelhamid et al., 2016), making the consumption of energy, protein and micronutrients easier, without considering the root causes of malnutrition and if they can be treated. However, evidence suggests mixed results with supplement use and promoting and sustaining weight gain, and no evidence that these supplements will improve eating behaviour or quality of life for residents (Abdelhamid et al., 2016). With the high prevalence of malnutrition in resident populations, there is an urgent need to address multi-level factors that contribute to poor food intake (Bell et al., 2013; Keller et al., 2017a).

Relational aspects of care and how they can influence nutritional status specifically requires further investigation. There is a growing interest in the nature of interactions between staff and residents during mealtimes to improve food intake. For example, Keller and colleagues (2017a) found that PCC practices were associated with higher energy intake among residents. Similar findings were reported by Liu et al. (2020a) where positive and negative verbal utterances resulted in differences in food and fluid intake during eating assistance. The impact of family member eating assistance on resident food intake was explored by Durkin and colleagues (2014) where they reported

no significant change in consumption, though their methods of determining intake may have impacted their findings. However, such considerations for the quality of mealtime interactions related to food intake must be interpreted using a relational lens. For example, improving of interaction between resident and staff requires there be certain staffing ratios to ensure dedicated time in supporting residents with eating (Simmons & Schnelle, 2004), yet research has demonstrated that understaffing remains a constant issue among many LTC homes (Harrington et al., 2020; Hsu et al., 2016) and shortages are particularly evident during mealtimes where inadequate staffing has resulted in poor food intake and malnutrition (Kayser-Jones & Schnell, 1997; Woo et al., 2005).

Research has described such situations of understaffing impacting resident nutritional intake where residents are placed in unsafe positions while eating, solid foods are mixed with liquids to expedite eating assistance, residents were verbally abused and force fed, and in some instances, residents did not eat at all (Kayser-Jones & Schell, 1997; Palese et al., 2019a). Perspectives of staff in relation to food and nutrition care in LTC settings identify challenges in ensuring adequate nutritional intake at the resident level, as well as difficulties with other staff disciplines and home policies (Blumberg et al., 2018; Liu et al., 2020b). For instance, Blumberg and colleagues (2018) found that staff felt their knowledge and perspectives on resident nutrition care were undervalued by those in higher positions, including nurses and registered dietitians. Interestingly, Keller et al. (2017a) identified dietitian time greater than 18.75 hours per week to be associated with significantly more protein intake among residents. While this increase in resident food intake may be an outcome related to a number of factors, such as better menu planning, assessment, and treatment, increased dietitian time may also play a role in supporting positive working relationships and effective communication with staff to adequately address nutrition concerns. These few studies note the complex interplay of relational multi-level factors that should be considered when determining how to improve food and fluid intake and thus nutritional status of residents.

2.5 Improving the Mealtime Experience and Food Intake for Residents

For residents, mealtimes may be the most important point in the day to socialize with others (Campo & Chaudhury, 2012; Doyle, de Medeiros, Saunders, 2011; Manthorpe & Watson, 2003). As discussed previously, the connection one has with food and with sharing meals with others is an important aspect of well-being over the lifecourse, inclusive of those life stages where cognitive capacity may be different than it once was (Bungaard, 2005; Hung & Chaudhury, 2011; Manthorpe & Watson, 2003). These connections during meals extend beyond actual time spent eating; participating in rituals associated with dining preparation, cooking, and meal clean-up are important areas of contribution for RLWD, in addition to an exercise in asserting relational autonomy, identity, and control (Bungaard, 2005; Harmer & Orrell, 2008; Hung & Chaudhury, 2011; McKinley & Alder, 2006; Wikström & Emilsson, 2014). These meal-related activities are part and parcel of ordinary life and are considered key aspects of quality of life for all residents (Anderson et al., 2004; Harmer & Orrell, 2008).

Mealtimes in LTC settings are increasingly being recognized as an area for improvement, as the opportunities afforded to support not only residents' physical health but also their overall well-being is rich with potential. As such, there is growing interest in the development and implementation of non-pharmacological interventions focused on improving residents' mealtime experiences. This may be partially explained by the LTC culture change movement, combined with the issue of LTC food and mealtimes being consistently identified as an area for improvement within this health sector (e.g., BC OSA, 2017; Ducak et al., 2015; Region of Peel, 2014).

Non-pharmacological interventions to date have included changes to dining room décor to make it more homelike (Chan et al., 2012; Perivolaris et al., 2006), intimate dining arrangements to support socialization between residents and reduce distractions (Chaudhury et al., 2017), staff education and training on personalized dining care (Wikby et al., 2009), playing calming music to set a relaxing dining atmosphere (Chang et al., 2010), buffet-style dining to support autonomy around food choices (Remsburg et al., 2001), and family-style dining to mirror past mealtime rituals (Altus et al., 2002).

Based on the findings from several literature reviews on mealtime-focused interventions, it is evident that there is a strong potential to make changes at mealtimes in order to improve the overall dining experience of residents (Abbott et al., 2013; Chaudhury et al., 2013; Vucea et al., 2014; Whear et al., 2014), although generally research was of low quality and requires confirmation. There are two key areas pertinent to this dissertation that will be elaborated for improving resident mealtimes and potentially nutritional status in LTC homes: the role of eating assistance and family involvement at mealtimes.

2.5.1 Supporting Residents who Require Eating Assistance

Eating assistance is understood as support provided to a person which enables them to complete the eating process using verbal, nonverbal, and physical prompts when transferring food from the plate to a resident's mouth (Osborn & Marshall, 1993). Eating assistance is most commonly provided to RLWD in LTC as eating challenges are associated with the progression of dementia (Giebel et al., 2015). Examples of eating assistance include helping direct a resident's hand from plate to mouth (i.e., hand-over-hand; hand-under-hand), cutting food into bite-size portions, arranging food on a plate in a strategic way, preparing enticing foods that can be eaten with their hands (i.e., finger foods), offering words of encouragement while prompting, and/or using light touch on the cheek, jaw or neck to encourage or remind residents to chew and swallow (Batchelor-Murphy et al., 2017; Liu et al., 2015; Manthorpe & Watson, 2003).[4] Consistent eating assistance has been found to be a protective factor against potential malnutrition in LTC homes, as residents who are no longer able to eat on their own are identified by staff as needing full support at meals. A recent Canadian study conducted by Keller and colleagues (2017a) identified that almost one-quarter of residents needed some form of physical eating assistance and was one of the main predictors of energy and protein intake (Keller et al., 2017a). However, those residents who varied in their self-feeding abilities were found to eat less compared with those who could still eat

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[4] Eating assistance in this context does not include enteral feeding (i.e., tube feeding).

independently or as compared with those who received full assistance at every meal (Keller et al., 2017a). These findings not only demonstrate the importance of dedicated physical assistance to meet nutritional needs but have important implications for identifying and monitoring those who are on the cusp of losing their self-feeding abilities, as well as the types of techniques used to support these individuals.

Restorative eating assistance are techniques used to help residents maintain their physical abilities, with a focus on the prevention of residents developing "excess disability" around self-feeding, meaning a loss in ability to reasons other than the progression of dementia (Keller et al., 2017a; Liu et al., 2015; Batchelor-Murphy et al., 2017; Slaughter et a., 2011). Slaughter and colleagues (2011) found that 40% of RLWD experienced challenges self-feeding, however, half of this disability was attributed to excess disability; these eating difficulties could have been potentially treated or avoided. The authors suggested that less supportive dining environments double the hazard of developing an eating disability compared to those in more person-centred, supportive spaces (Reimer et al., 2004; Slaughter et al., 2011). Further, excessive or unnecessary eating assistance by carers, regardless of the RLWD's level of self-feeding ability, can accelerate a resident's excess disability by diminishing their abilities to self-feed, hinder their sense of control over their mealtime experience, and decrease overall enjoyment while dining, resulting in (warranted) resistive and aggressive responses (Amella, 2002; Gibbs-Ward & Keller, 2005; Liu et al., 2015). For eating assistance to be of benefit, the person providing assistance must have prior knowledge about the resident's eating capacities and establish a trusting relationship so that the type of assistance provided does not somehow result in excess eating disability.

There is a paucity of intervention research with respect to improving eating assistance and the potential social connectedness that can occur with this activity. A literature review of interventions to support food intake with oral feeding options for persons living with dementia conducted in 2013 included only one study focused on physical eating assistance out of the thirteen identified articles; almost all other studies reviewed used nutritional supplements to improve RLWD nutritional intake (Hanson et al., 2013).

Furthermore, all primary outcome measures used for these interventions consisted of tracking weight and body mass index (BMI); none considered whether the nature of the eating assistance provided to the resident was person- or relationship-centred (Hanson et al., 2013). One study conducted by Simmons and colleagues (2017) examined the cost-effectiveness of involving non-nursing staff to assist with eating assistance within LTC homes as a means to increase resident food and fluid intake and reduce costs associated with spending additional time with residents who required eating assistance. A more recent review conducted by Liu and colleagues (2015) identified eleven intervention studies that showed promise to improve nutritional outcomes, including maintaining resident weight, nutritional intake, and managing "behavioural symptoms" (Liu et al., 2015). However, studies that involved training programs or mealtime assistance components were delivered by trained research assistants and researchers, not home staff (Liu et al., 2015), thus missing the opportunity to develop longstanding relationships between resident and staff. The most recent literature review conducted by Abdelhamid et al (2016) found that eating assistance programs that incorporate strong social elements demonstrated the greatest potential to improve quality of life (Abdelhamid et al., 2016). To the author's knowledge, no intervention studies to date have focused on or accounted for the positive, reciprocal, and restorative exchanges that can occur when staff are trained on RCC eating assistance practice. Finally, eating assistance interventions within institutional settings are focused on educating and training paid care staff (or researchers, as mentioned above) and do not acknowledge the potential to involve others who have close relationships with those RWLD who require additional eating support (e.g., Liu et al., 2015).

2.5.2 Family involvement and supporting relationship-centred mealtimes

For many, family involvement in care does not stop once the older relative has transitioned into LTC (Davies & Nolan, 2004; Robinson et al., 2010). Of the 5.4 million Canadians who cared for an older relative or friend in 2012, 14% of these informal care partners were supporting someone living in LTC or admitted to hospital (Turcotte & Sawaya, 2015); many of whom are women (Gilmore-Bykovskyi et al., 2018). Sometimes referred to as "the backbone of the long-term care system", almost a quarter of these

families provide over 10 hours of weekly care in LTC homes, with hours increasing if a resident was living with severe health conditions or living with dementia (Levine, Halper, Peist & Gould, 2010; Turcotte & Sawaya, 2015). Families have been described as taking on a variety of roles, from hands-on care (i.e., showering, toileting), to providing socioemotional support and linking the resident to the outside community (Helgesen et al., 2015), to advocating and monitoring the level and quality of care received by their loved one (Baumbusch & Phinney, 2014; Holmgren et al., 2013). Regardless of geographic distance, families oversee and manage care both inside and outside the LTC home, for example driving their relative to medical appointments, managing their relative's affairs from afar, and providing supplies and comfort items, such as preferred food condiments (Reid & Chappell, 2017). Scholarship on family involvement in LTC has grown over the last two decades (Puureveen et al., 2018). In a recent review of the literature, Puurveen and colleagues (2018) bring to light the complexities of family engagement within the LTC home. While frequency of visits has historically been used to gauge level of family involvement in a resident's life, the authors identify the variability of this temporal element, whereby family involvement is described as "fluid" over time (Puurveen et al., 2018), most often in response to concerns of standards of care or the need for increased support if a resident's health condition deteriorates (Gladstone, et al., 2006). This is especially true for RLWD. Family members hold important historical knowledge about the resident, which can provide much needed direction and guidance as their care needs increase (Cohen et al., 2014; Gaugler et al., 2007; Tornatore & Grant, 2002;has id Yamamoto-Mitani et al., 2002).

The growing body of literature on food and mealtimes in LTC is a strong indication of the unrelenting human desire for social connection, as residents negotiate the link between meals past and present (Abbott et al., 2013; Chaudhury, Hung & Badger, 2013; Faraday et al., 2021; Lorini, Porchia, Pieralli & Bonaccorsi, 2018; Reimer & Keller, 2009; Vucea et al., 2014; Watkins et al., 2017). We know from the limited discourse on family participation in LTC settings that many families desire to maintain close connections with their relatives through meals, and view person-centred mealtimes as an important aspect of quality of care for residents (Henkusens et al., 2014; Lowdnes et

al., 2015; Milte et al., 2018; Ryan & McKenna, 2015; Tsai et al., 2020). Ideally, family members are provided with opportunities for inclusion within LTC homes to the same degree that they consider their own involvement to be valued and important (Reid & Chappell, 2017). As food and meals are a familiar ritual most families have engaged in before transitioning into LTC, mealtimes may be able to provide a medium through which can exercise their cultural traditions and norms with their relatives (Petersen et al., 2016). In doing so, with the support of the LTC home, families can progress from being involved to being recognized and included as valued members within the LTC homes.

Shared family mealtimes in LTC homes offer opportunities for developing and sustaining family connectedness (Keller et al., 2010), help families to cope with their changing realities transitioning into LTC (Henkusens et al., 2013), and offer opportunity for resident and families to reaffirm shared identities (Genoe et al., 2010). Yet, a recent study by Reid and Chappell (2017) examining the degree to which family members perceive their opportunities for involvement in LTC homes reported that the majority of family member participants were not able to dine with their relatives when they wanted to. Moreover, there is limited research today that has actively explored the role that families play to support resident mealtimes, particularly those who struggle with eating challenges (Durkin et al., 2014). This disruption to those who wish to maintain family cohesion through mealtime rituals and eating support has significant implications for the well-being of families, as they are forced to re-work their ties with one another in these formal care contexts.

Descriptions of family involvement within the literature are regarded as peripheral occurrences that serve as examples of ways some families connect with their relatives. Families involved in meals tend to spend their efforts on supporting resident care, such as ensuring that their relative is eating well by providing physical eating assistance (Petersen et al., 2016; Purveen et al., 2018), informing staff of resident's food preferences (Bramble et al., 2009), ensuring that their relatives are seated with others they get along with (Baumbusch & Phinney, 2014; Cohen et al., 2014; Petersen et al.,

2016) and in some cases, dining with their relative (Barken & Lowndes, 2018; Petersen et al., 2016). Families have been described supporting their relatives, as well as other residents with the same ethno-cultural background, by bringing in culturally appropriate foods from home (Barken et al., 2007; Xiao et al., 2007). In one Australian study examining the role of families at mealtimes, the presence of families "dramatically changes the atmosphere of the facility", where residents' faces "lit up" with excitement (Petersen et al., 2016). In some cases, however, research has reported instances where families were actively discouraged by care staff from dining with their relative as either "punishment" for voicing concerns on behalf of the resident or because staff felt that care should be provided by them and not by families (Baumbusch & Phinney, 2014; Davies & Nolan, 2004; Reid & Chappell, 2017). Instances such as these dissuade attempts made by families to maintain relationships with residents and aggravate existing tensions between staff and family. Durkin and colleagues (2014) examined whether the presence of family members during meals impacted the quality of eating assistance they received by care staff and whether resident intake improved. The authors state that while the time dedicated to assisting a resident increased with the presence of family, intake did not significantly improve, though the researchers used estimated food intake vs. more accurate actual weighed food intake (Durkin et al., 2014). This finding brings into question whether care staff dedicated more time to those residents because they felt they were being monitored by family members or whether they had a positive relationship with that family and enjoyed their company. Furthermore, this study did not examine whether or not resident food intake would improve with assistance directly from family, as well as other psychosocial benefits of having families present at meals (Durkin et al., 2014). However, the authors speculate that promoting family visitation during mealtimes could be the purposeful activity that provides family members with opportunities for meaningful involvement and identify this as an area for future research (Durkin et al., 2014).

2.6 Study Implications

This research has implications for the conditions of RCC mealtime practices, the contributions of family as essential members of LTC communities, and the importance

of accounting for the interplay between social participation during mealtimes on the nutritional status of residents. Our understanding of the experiences of residents and their mealtimes comes primarily from qualitative studies where observations, conversations, and interviews provide a glimpse into the complexity of meals within LTC settings. What is often described in the literature is a duality between meaningful social connections between residents, staff, and family members, contrasted against the active and recurrent undermining of resident autonomy, rushed and task-focused mealtime care – in particular for those with eating and other mealtime challenges, and involved families providing essential care with little support or recognition (Baumbusch & Phinney, 2014; Harnett & Jönson, 2017; Hung & Chaudhury, 2011; Lowndes et al., 2015; Watkins et al., 2017). Often times these tensions are a consequence of a heavily strained and regulated care environments that place good care second to productivity and efficiency. By focusing on the multi-level factors that contribute to mealtime care practices, the role that families play in nutrition care, and resident communication factors and the social mealtime environment and malnutrition, we may be better equipped to modify home and system factors to support RCC mealtimes and ultimately the culture change movement within Canadian LTC homes.

Chapter 3: Research Objectives, Hypotheses, and Questions

The following are the research objectives and hypotheses addressed by the three different research studies that comprise this dissertation.

3.1 Part 1. Multi-level factors associated with relationship-centred and task-focused mealtime practices in long-term care: A secondary data analysis of the M3 Study

Objective: To explore the multi-level factors associated with staff mealtime care practices (RCC and TF) and how mealtime practices are different for those residents who require physical eating assistance.

Hypotheses

P1-1 H_o: There is no significant ($p>0.05$) association between home characteristics (e.g., for profit status, large homes, continuums of care) and mealtime care practices (RCC/TF) when adjusting for resident and dining room covariates.

H_a: For profit status homes are more likely to have TF care practices at mealtimes than non-profit homes.

H_a: Large homes (i.e., >100 beds) are more likely to have TF care practices at mealtimes than small homes.

H_a: Continuums of care are more likely to have RCC care practices at mealtimes.

H_a: Residents living in home areas with renovations in the past 5 years are more likely to receive RCC practices than older, unrenovated home areas.

P1-2 H_o: There is no significant ($p > 0.05$) association between dining room characteristics (e.g., number of residents requiring physical eating assistance, number of staff involved in eating assistance, ratio of residents per care staff involved in eating assistance, number of family/volunteers involved in eating assistance, specialized dementia home areas, and mealtime care practices (RCC/TF) when adjusting for covariates.

H_a: Residents in dining rooms with a high number of residents requiring physical eating assistance are more likely to receive TF practices than residents in dining rooms where fewer residents require physical eating assistance.

H_a: Residents in dining rooms with higher numbers of staff involved in eating assistance are more likely to receive TF practices than residents in dining rooms with fewer staff involved in eating assistance.

H_a: Residents in dining rooms with a higher ratio of residents to staff involved in eating assistance are more likely to receive TF practices than residents in dining rooms with a lower ratio of residents to staff involved in eating assistance.

H_a: Residents in dining rooms with more family /volunteers involved in eating assistance are more likely to receive more RCC practices than those residents in dining rooms with fewer family/volunteers involved in eating assistance.

H_a: Residents in dining rooms located within specialized dementia home areas are more likely to receive RCC practices than those residents in dining rooms located in general home areas.

P1-3 H_o: There is no significant ($p > 0.05$) association between resident characteristics (e.g., requiring eating assistance) and mealtime care practices (RCC/TF) when adjusting for home and dining room covariates.

H$_a$: Residents who require eating assistance are more likely to experience TF mealtime practices.

Research Question

P1-4   Is there a difference in the proportion of RCC and TF practices experienced by residents who require physical assistance as compared to those who do not requiring eating assistance?

3.2 Part 2: Family member eating assistance and food intake in long-term care: A secondary data analysis of the M3 Study

Objective: To explore potential impact of family member eating assistance at mealtimes on food intake for residents requiring eating assistance.

Research Question

P2-1   Is there a difference in resident characteristics between those who receive mealtime assistance from family/volunteers as compared to those who are assisted by staff?

Hypothesis

P2-2   H$_o$: There is no significant (p>0.05) difference in energy (kcal) and protein (g) intake when residents are assisted by a family member/volunteer as compared to when they are assisted by staff.

H_a: Energy and protein intake are significantly higher at meals where residents are assisted by family/volunteers, as compared to meals where they are assisted by staff.

3.3 Part 3: Exploring associations between resident sensory and communication challenges, staff and family dining interactions, and resident malnutrition in long-term care: A secondary data analysis of the M3 Study

Objective: To determine how resident communication abilities (vision, hearing deficits, capacity for verbal communication), wayfaring (i.e., wandering) and staff mealtime practices and family eating assistance or food support are associated with resident malnutrition.

Hypotheses

P3-1 H_o: There is no significant ($p>0.05$) associations between resident sensory and communication characteristics, staff care provision, and family food involvement with resident malnutrition.

H_a: Residents with sensory and verbal communication impairments are significantly more likely to be malnourished than residents without these impairments.

H_a: Residents who wayfare during meals are significantly more likely to be malnourished than residents who do not wayfare during meals.

H$_a$: Residents who receive more TF practices are significantly more likely to be malnourished than residents who receive RCC practices.

H$_a$: Residents who receive family eating assistance or food support are significantly less likely to be malnourished than residents who do not receive family eating assistance or nutrition support.

Chapter 4: Part 1. Manuscript 1: Multi-level factors associated with relationship-centred and task-focused mealtime practices in long-term care: A secondary data analysis of the M3 Study

Manuscript submitted for publication.
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4.1 Overview

Care provision during mealtimes in long-term care (LTC) can help to reinforce relationships between staff and residents through relationship-centred care (RCC) practices. Due to external factors, care provision is often task-focused (TF) at mealtimes. This study explores the complex interaction of multi-level factors that contribute to RCC or TF mealtime practices. Secondary data from residents in 32 Canadian LTC homes were analyzed (n=634; mean age 86.7 ±7.8; 31.1% male; 23.2% required eating assistance). Data included resident health record review, standardized mealtime observation tools, and valid questionnaires. More RCC (9.6±1.4) than TF (5.6±2.1) practices were observed. Multivariable regression revealed TF practices more likely to occur with larger home size, care continuums, more staff involved in assisting, male residents, and residents requiring eating assistance. RCC practices were observed more often in for-profit homes, those with recent renovations, and female residents. System factors need to be addressed to reduce TF practices.

4.2 Introduction

Food, eating, and mealtimes within long-term care (LTC) homes are complex processes. In addition to the many necessary activities that occur during a meal (Gibbs-Ward & Keller, 2005), eating with others can reinforce identity, solidarity, and community, but they can also serve to exclude, demean, and reject (Henkusens et al., 2014; Hung & Chaudhury, 2011; Palese et al., 2019a). Though the social aspects of mealtimes may be as important to a resident as the nutritional value of the meal itself

(Bennett et al., 2014), the embedded biomedical model that underpins Canada's LTC system places emphasis on the functionality of meals by prioritizing objective measures, such as resident food intake and efficient mealtime processes (Banerjee & Armstrong, 2015; Kontos et al., 2010). As a result, the social importance of meals in these formal care settings is often discounted and fails to provide the comfort of meals past (Douglas, 1975). As commensal eating occasions occur at least three times a day, every day, for residents, staff (i.e., care aides, personal support workers), families, and home administrators, there is the potential for these task-focused practices to impair quality of life for those involved and may also impact food intake and nutritional status. Specifically, for those residents who rely on physical assistance for eating, the undervaluing of social connections during meals may compound feelings of social isolation and loneliness (Karlsson et al., 2009; Moyle et al., 2015; Palese et al., 2019b).

Relational Mealtimes

Mealtimes hold significant importance for residents living in LTC homes; they are a symbol of normalcy and a social focal point for residents, staff, and families (Baumbusch & Phinney, 2014; Bennett et al., 2014; Campo & Chaudhury, 2012; Palacios-Ceña et al., 2013). Meals provide a temporal structure to the day (Barnes et al., 2013; Nijs et al., 2006) and offer opportunities to make connections and support relationships with others (Henkusens et al., 2014; Petersen et al., 2016). For residents living with dementia, mealtimes may be one of the few times within a day to socially engage with others (de Medeiros et al., 2012; Manthorpe & Watson, 2003). Opportunities for social connection during meals often extends beyond actual time spent eating. Participating in tasks associated with dining such as assisting with place settings, planning special food-centred events, cooking, and mealtime clean-up are important areas of contribution for residents living with dementia and help reinforce a resident's autonomy, identity, and control (Harmer & Orrell, 2008; Hung & Chaudhury, 2011; McKinley & Adler, 2012; Wikström & Emilsson, 2014).

The complexities of mealtimes in LTC can be examined using a relational lens: relational theory postulates that individuals are shaped by their social, political,

economic, and cultural circumstances, rejecting the notion that individuals function independently from the systems and structures around them (Sherwin & Winsby, 2010). With respect to dining, these individuals are residents who eat in the dining room, family members who may join them, as well as direct care and managerial staff who support mealtime processes. In LTC, social models of care (i.e., non-prescriptive practices) that help to reinforce a sense of belonging for residents are often challenged by the hierarchical and systematized approaches taken with mealtimes. For vulnerable residents and direct care staff who may be marginalized, social models of care where residents' wishes are known and respected and staff empowered to provide quality care can be undermined. For example, resident autonomy may be challenged in almost every aspect of the meal process, from what time meals are served, to whom one sits with in the dining room; it is the reason why it is crucial to provide residents with opportunities to make choices and participate in mealtime processes so as to support their relational autonomy and engagement in the home (Abbott et al., 2013; Sherwin & Winsby, 2010). For care staff, "the conditions of work are the conditions of care" (Baines & Armstrong, 2018, p.1), meaning that a precondition for meaningful resident care is a working environment that fosters supportive conditions for those providing the care. Thus, we recognize that micro-interactions between residents and staff are influenced by relational factors including policies, funding structures, and the marketization of the Canadian LTC sector (Baines & Armstrong, 2018; Harrington et al., 2017).

Mealtime Interactions: Relationship vs. Task

The innermost mealtime interactions between those who live and work in LTC are understood in this study as relationship-centred care (RCC), a social model of care that embraces the importance of reciprocity in caring relationships: residents give just as much as they receive (McCormack, 2001; Tresolini et al., 1994). Unlike the person-centred care approach that places emphasis on individual needs and preferences of the resident, the RCC philosophy includes caring, interdependent relationships that go beyond resident and staff to include family members, other significant relations, and the greater community (Nolan et al., 2004). An example of RCC practices between staff and

residents at mealtimes is when residents are typically offered a clothing protector. The simple RCC practice of staff *offering* a resident assistance with putting on a clothing protector provides an occasion to acknowledge interdependent dynamics where staff recognize a resident's autonomy (i.e., a choice to accept or decline assistance), and if the resident shows gratitude for staff's support and thoughtfulness, this in turn reinforces a mutual appreciation for both parties. In contrast, task-focused (TF) practices are those that undermine the relational autonomy of both residents and staff (Savundranayagam, 2014). Using the same example, staff placing a clothing protector on a resident without first asking permission (or at least foreknowledge for residents who are not verbally communicative) is a situation where staff substitute their personal judgement for what they believe is best for that resident (Sherwin & Winsby, 2010). The staff member's personal autonomy would be further undermined if this behaviour was reinforced and mentored by more senior staff and leadership as a means of promoting meal efficiency. A resident may feel disrespected, patronized, and/or objectified by this action as they are given no opportunity to exercise their autonomy or verbally respond to the staff member, resulting in not only a lost opportunity to reinforce their relationship but also potentially jeopardizing their connection.

A recent study by Lee and colleagues (2020) reported that specific LTC staff behaviors during mealtimes were closely linked to responsive behaviours among residents living with dementia. Furthermore, these task-based approaches often preceded frustrated responses from residents (Lee et al., 2020). Staff may enact this TF practice for a number of reasons, for example, staff may make the assumption that residents living with dementia cannot express their preference or that they feel rushed to begin the meal by a certain time and therefore taking this action is the most efficient approach. We should also consider staff's relational autonomy to more fully understand these TF scenarios, in that staff may be operating within a LTC context (e.g., regulations, policies, processes) that may undermine their abilities to enact RCC practices. Previous research has demonstrated the link between care staff's experiences of job satisfaction and organizational context, specifically leadership, social capital, culture, and the organization's responsiveness to internal and external pressures (Chamberlain et al.,

2016; Squires et al., 2015). Situations where staff feel a lack of support from leadership and peers (Kuo et al., 2008; McGilton et al., 2020;) or disempowered with a lack of decision-making capacity (Gaudenz et al., 2019; Parsons et al., 2003) can result in lower quality of care and ultimately result in leaving the LTC workforce (Bowers et al., 2003)

One may take the view that dissecting these micro-interactions between residents and staff as nugatory; however, the reality is that staff provide anywhere between 75 to 90% of direct care to residents (Estabrooks et al., 2015a; Estabrooks et al., 2015b), making the dynamics of this dyad one of the most important quality of life factors for residents (Kehyayan et al., 2015); this is especially true for those residents with poor food intake who rely on staff for eating assistance and social connections (Liu et al., 2020a). The current study seeks to understand the complex interaction of multi-level factors (i.e., resident, dining room- and home-levels) in contributing to RCC and TF practices in the dining room in Canadian LTC homes, as well as the potential differences in staff mealtime practices amongst residents with eating challenges. The following review provides a basis for the factors used in this analysis.

Resident-Level Mealtime Factors

As residents progress in their dementia journey, participating in regular meal-related activities may become increasingly more challenging as sensory (e.g., taste, smell) and cognitive changes (e.g., recognizing foods, recalling steps involved with eating) impact their abilities and desires to eat (Loughrey et al., 2018; Roberts et al., 2016; Wu, 2014). Upwards of 70% of residents living with dementia will experience challenges associated with neurological and visuomotor changes (Abdelhamid et al., 2016; Keller et al., 2017a; Namasivayam-MacDonald et al., 2018; Slaughter et al., 2011). Dysphagia risk (difficulty/discomfort while swallowing) was found to affect almost 60% of residents in Canadian LTC homes, resulting in almost half of residents requiring modified textured diets and thickened fluids to prevent choking, and in some cases, verbal and physical eating assistance (Keller et al., 2017a). Poor oral health is common among those living

with dementia and can also make eating difficult and/or painful (Chalmers & Pearson, 2005).

Yoon and colleagues (2018) found that oral health status likely impacted the ability of half of Canadian LTC residents. Residents living with dementia may experience challenges with verbal communication, making it difficult to express their mealtime needs and preferences, as well as emotional and relational needs (Liu et al., 2020a; Milte et al., 2017; Stubbs et al., 2016; Cadieux et al., 2013). Psychosocial and physiological implications related to dysphagia and eating challenges can have negative impacts on residents' well-being and self-esteem, particularly in group dining settings (Ballard et al., 2001; Donnelly et al., 2016; Ekberg et al., 2002; Slaughter et al., 2011). Mealtime interactions between residents and care staff are typically discussed in the literature in relation to improving food intake and supporting residents with eating challenges; yet there is little reference to the quality of social mealtime care and other factors that may play a role in these interactions. Specifically, for residents with more cognitive and physiological care needs, it is unknown as to how mealtime interactions vary from those who are more independent.

Dining Room-Level Factors

The mealtime is made up of a series of processes (e.g., transporting residents, seating, preparing to eat, serving foods and fluids in multiple courses, mealtime support and eating assistance, clearing dishes, and exiting the dining room) and interactions (e.g., asking permission, telling a story, sharing a laugh, giving light comforting touch) between key players: care staff, residents, and family members (Gibbs-Ward & Keller, 2005). Research that has examined mealtime processes in LTC homes describe them as hectic and task-focused (Hung & Chaudhury, 2011; Sloane et al., 2008; Watkins et al., 2017). A multi-country rapid ethnography conducted by Lowndes and colleagues (2018) found Canadian LTC homes had poor-quality dining experiences compared to mealtimes in Germany and Norway. The detailed minute-to-minute account of these fast-paced and time-controlled mealtimes demonstrated a lack of ability for staff to make

meaningful social connections with residents, as low staffing levels meant that staff had to rush from table to table (Lowndes et al., 2018). In some provinces, like Ontario, regulations stipulate for safety reasons that staff may support up to two residents at a time with eating assistance (MOHLTC, 2007). As a result, family members or volunteers often compensate for low staffing levels by providing eating assistance (Green et al., 2011; Steele et al., 2007), as well as to meaningfully connect with their loved ones (Baumbusch & Phinney, 2014; Durkin et al., 2014; Wu et al., 2020). Instances where little or no external supports are available may result in staff using negative approaches such as rushing residents through their meals (Liu et al., 2020b; Lowndes et al., 2018). Research has described instances of staff resorting to intimidation tactics, deprivation, punishment, eliciting feelings of guilt and/or force feeding to promote food intake among LTC residents, many of which can either be categorized and/or assumed as features of psychological and/or physical abuse (Palese et al., 2019a; Schiamberg et al., 2012). In addition, staff are required to spend a considerable amount of time documenting resident health indicators (that often fail to consider the quality of life of residents), including resident food and fluid intake, which has been cited as both a deterrent to time spent socializing, as well as a process that reinforces task-based approaches (Armstrong et al., 2016; Banerjee & Armstrong, 2015; Lowndes et al., 2015). There is no denying the importance of accounting for the health status of residents in order to ensure that they are not at risk of malnutrition, however, this level of auditing paired with persistent understaffing ultimately undermines the importance of the social aspects of meals between residents, staff, and families (Armstrong et al., 2016; Banerjee & Armstrong, 2015; Kontos et al., 2009).

Long-Term Care Home System Factors

The physical layout and operating systems of a LTC home play important functions in shaping mealtime experiences (Chaudhury et al., 2018; Slaughter et al., 2020). Research examining the role of the physical dining environment has found it to be critical in supporting residents' functional abilities, providing orientation cues, creating a sense of safety and security, and eliciting feelings of familiarity and homelikeness

(Chaudhury et al., 2013; Ducak et al., 2015). Structural renovations to LTC homes, for example, to dining rooms, can provide opportunity to create comfortable dining spaces for residents and encourage teamwork among staff (Chaudhury et al., 2017). Though the dining environment is an important aspect of creating enjoyable mealtime experiences, research has shown that improvements made to dining spaces can be less effective if a resident's higher order needs, such as feelings of belonging and self-esteem, are not being met (Chaudhury et al., 2017; Hung et al., 2015; Willemse et al., 2015). As mentioned, understaffing can make providing RCC to residents during mealtimes extremely difficult. Canadian research has demonstrated that municipal and non-profit homes typically operate with a higher staff-to-resident ratio, as compared to for-profit homes that may reduce staffing numbers to lower operating costs; this is a significant and consistent distinction between the different types of Canadian home ownership models (Berta et al., 2005; Berta et al., 2006; Hsu et al., 2016; Harrington et al., 2017; McGregor et al., 2005). A consequence of being understaffed, regardless of profit structure, is high staff turnover and staff burnout that can include emotional exhaustion, cynicism, and a lack of professional efficacy (Bos et al., 2016; Chamberlain et al., 2017; Gaudenz et al., 2019). This in turn can result in lower quality resident care (Huang & Bowblis, 2018). Larger LTC homes (i.e., those with more than 100 beds) tend to be operated by for-profit chain companies that may also include continuums of care where LTC homes are attached to retirement or assisted living facilities. These large for-profit chains have the ability to consolidate decision-making power to fewer stakeholders, which translates into economies of scale, thus allowing for further consolidation of their enterprises (Baines & Armstrong, 2018; Daly, 2015). Continuums of care may result in improved processes within the retirement residences, as homes benefit from the health professionals involved in care of residents in the LTC component (e.g., menu planning, infection control, recreation etc.) and a consequent sharing of expertise. They may also have more stable staffing, due to a larger pool from which to draw between retirement and LTC areas. Furthermore, residents may be exposed to a greater sense of community, additional facilities (e.g., gym), visitors, and recreational activities if physical spaces and opportunities to mix with retirement residents are provided.

The authors recognize the critical role that family members and other significant relations play at mealtimes in LTC homes (e.g., providing eating assistance, socializing) (Wu et al., 2020), however, interactions with this group is not the main focus of the current study. We apply the Making the Most of Mealtimes (M3) conceptual social ecological model to identify and understand relational interactions between micro-, meso-, and macro-factors that influence mealtime care practices in Canadian LTC homes: the resident (i.e., meal access, meal quality, mealtime experience), the home (e.g., staff, physical environment, model of care), and the government (e.g., policies, funding) (Figure 4.1; Keller et al., 2014). Specifically, resident-, dining room- and home-level factors will be explored in relation to the provision of RCC and TF practices observed during mealtimes. To the authors' knowledge, this is the first Canadian multi-site observational study that examines the relationship between multi-level factors and mealtime interactions between residents and care staff, in particular, those residents who would interact most often with staff during mealtimes – those who require physical eating assistance. As such, this study looks to explore the following: i) what factors (resident, dining room, home) are associated with RCC practices and TF practices at mealtimes, when adjusting for theoretically modeled covariates, and ii) how do RCC and TF practices during mealtimes vary for residents' requiring different levels of physical eating assistance?

4.3 Methods

4.3.1 Study Design
A secondary data analysis of the Making the Most of Mealtimes (M3) cross-sectional study was conducted. The M3 study examined multi-level factors associated with resident food and fluid intake across 32 Canadian LTC homes. Further details on the M3 study's research questions and data collection procedures can be found in the published study protocol (Keller et al., 2017b). This current study is a cross-sectional examination of the association between resident physical eating assistance

requirements, the quality of eating assistance provided, resident nutritional intake, and larger structural aspects of LTC homes and systems that may impact quality of care.

4.3.2 Participants and Sample Selection

Purposive sampling was used to recruit LTC homes from Alberta, Manitoba, Ontario, and New Brunswick (Keller et al., 2017b). Eight homes per province was selected to achieve diversity in home size, profit-status, model of care, ethno-cultural factors, geographic location (urban/rural), and other home-level factors that are known to impact food intake among residents (Keller et al., 2017b). Homes were eligible to participate in the M3 study if they: 1) were operating for a minimum of 6 months; and 2) had a minimum of 50 residents who met the inclusion criteria. From each LTC home, residents were recruited from one to four randomly selected home areas. In LTC homes with dementia-specific home areas, one was selected to ensure the participation of residents living with dementia.

Residents were eligible to participate if they were: 1) 65+ years; 2) required a minimum of 2 hours of direct care per day (e.g., bathing, dressing, eating); 3) had lived in the home for a minimum of 30 days; and 4) were able to provide informed consent and/or had a substitute decision-maker provide consent. Residents were ineligible to participate in the study if they: 1) were deemed medically unstable; 2) were receiving convalescent or respite care; 3) required tube feeding; 4) were at the end of life, 5) ate their meals in areas other than the dining room; or 6) had advanced directives that excluded their participation in research studies. Eligible residents were identified by trained LTC staff in participating home areas. A random number table was used to determine the order of approaching residents for recruitment.

Upon expression of interest in participating, 20 residents per LTC home were recruited by M3 researchers to provide sufficient power for the original study aims (Keller et al., 2017b). Of 640 residents who were initially recruited to the M3 study, one withdrew consent to participate. The remaining 639 participants in the final M3 sample were

eligible for inclusion in this current study; those who had complete data on all variables of interest for each analysis were included.

4.3.3 Data Collection and Measures

M3 study data collection began in October 2014 and ended January 2016, with a duration of approximately one month in each home. Data at the resident, dining room, and home levels were collected according to the M3 conceptual model (Figure 4.1) to evaluate the multiple interacting factors associated with food intake (Keller et al., 2014).
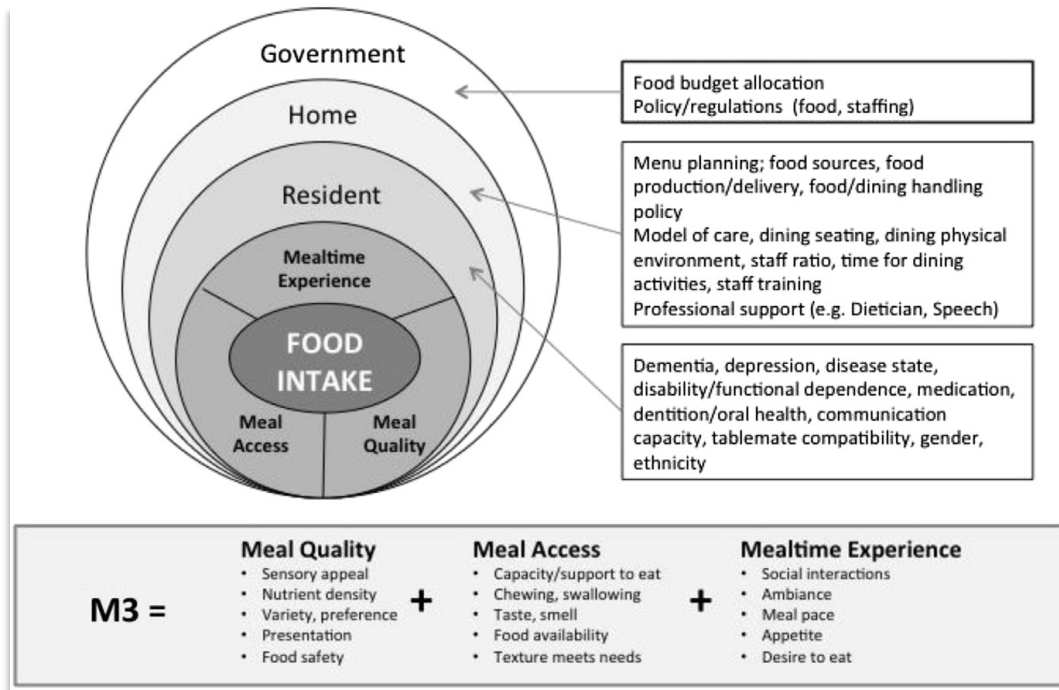
Figure 4.1 Conceptual Framework of the Making the Most of Mealtimes Study.

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Resident-Level Data

Data on *resident characteristics* were collected from a number of sources. Resident health records were reviewed for age, sex, weight, body mass index (BMI; determined by recorded weight and researcher measured ulna length), total number of diagnoses, and total number of medications. LTC staff were interviewed by M3 project coordinators to complete an assessment of selected components of the interRAI-Long-Term Care Form (LTCF; Hirdes et al., 2008) for each resident participant. InterRAI-LTCF measures included the cognitive performance scale (CPS) score (Morris et al., 1994), aggressive behaviour scale (ABS) score (Perlman & Hirdes, 2008), depression rating scale (DRS) score (Koehler et al., 2005), and the activities of daily living long-form (ADL-LF) score (Morris, Fries & Morris et al., 1999). Higher scores on the CPS (range: 0-6), ABS (0-12), DRS (0-14), and ADL-LF (0-28) indicated more advanced impairment or risk for each of the respective scores. Dysphagia risk was indicated if the resident had any of the following: a) prescribed thickened fluids, or b) failed water and applesauce swallowing challenge, or c) observed coughing or choking while eating/drinking during one of nine meal observations (Keller et al., 2017b). Residents' oral health was determined by a trained dental hygienist using a standardized assessment. This included rating the likelihood a resident would experience eating challenges related to oral health conditions (e.g., loose teeth) or had an acute oral health care need (e.g., abscess). Resident nutrition risk was determined using the Mini-Nutritional Assessment-Short Form (MNA-SF) (Kaiser et al., 2009), using information obtained from LTC home staff, residents' health records, and families. The MNA-SF scores range from 0-14, a higher score indicating better nutritional status.

Trained research assistants conducted standardized mealtime observations that captured the mealtime characteristics of the participants and the care interactions that occurred between them and others in the dining room. Weighed food intake and other resident behaviours (e.g., leaving the dining room/walking during meals) were observed at a total of nine meals over three non-consecutive days to meet the original study aims (Keller et al., 2017b). More detailed observations of each resident were conducted at three of these meals, including one breakfast, lunch, and dinner. These observations

provided data on the eating challenges experienced by residents using the Edinburgh Feeding Evaluation in Dementia Questionnaire (Ed-FED-Q) (Watson & Deary, 1997), and the quality of care interactions with staff and other residents using the Mealtime Relational Care Checklist (M-RCC) (Iuglio et al., 2019), described in more detail below. A single item from the Ed-FED-Q was used to determine the level of physical eating assistance required, "Does the resident require physical help with eating/feeding?"; scored as 'Never (1)', Sometimes (2)', or 'Often (3)' (Watson & Deary, 1997).

The *Mealtime Relational Care Checklist (M-RCC)* is a valid and reliable (RCC practices ICC= 0.73; TV ICC=0.85) checklist which is a part of the Mealtime Scan (described further below), which can be used on its own for individual resident assessment of mealtime interactions (Iuglio et al., 2019; Keller et al., 2018). Based on a relational lens that measures aspects of both RCC and PCC practices at mealtimes (although referred to inclusively as RCC), the first 17 items in the checklist provide information on mealtime interactions observed for all residents (e.g., social conversation, supporting individual preferences). Each item was dichotomized so that the observer scored whether or not they observed the relationship-centred care (RCC) practice (e.g., Are asked meal preference) and/or task-focused (TF) practices (e.g., Are not asked meal preference) over the duration of the meal. It was possible for both positive and negative care actions to be scored for some, but not all, of the 17 items. For example, TF item 1: "Resident is told where to sit/ assigned seating", versus RCC item 1, "Resident is given choice/ not assigned seating", would be scored as either observed or not observed – never both – during a single meal observation. Whereas TF item 7, "Is not informed of actions before taken" and RCC item 7, "Is informed of actions before taken" could both be observed during a single meal. All RCC actions and all TF actions were summed separately for each mealtime observation and then averaged across the 3 meal observations for each resident, to give an average RCC score and an average TF score, with a maximum of 17 for each. These two M-RCC scores, summarizing RCC Practices and TF Practices, are the main outcome variables of this study. The other 9 items of the M-RCC checklist focused on residents requiring eating assistance (n=127) were not included, as this would have resulted in a different maximal score for RCC and

TF practices for this subset of participants. The two M-RCC items on mealtime clean-up were also not used as they are not specific to individual interactions between residents and staff.

Dining Room-Level Data

Dining room-level mealtime audits included completion of the *Mealtime Scan (MTS)* that captures the social and physical dining environments, as well as the ways care is provided (i.e., M-RCC checklist described above) during mealtimes in LTC settings (Keller et al., 2017b). The MTS has demonstrated good inter-rater reliability (Keller et al., 2018) and construct validity (Iuglio et al., 2018b) for assessing the mealtime experience. MTS was completed by provincial research coordinators 4 to 6 times in each dining room representing all meals (breakfast, lunch, dinner) and subscales and item scores averaged (Keller et al., 2017b). Individual MTS items included in this analysis are the average number of residents who required physical eating assistance at a meal, average number of staff involved in providing eating assistance, and average number of family members/volunteers providing eating assistance. The average ratio of residents per care staff involved in eating assistance was calculated. Dining rooms located within a LTC home's specialized dementia home area were differentiated from dining rooms in general home areas.

Long-Term Care Home-Level Data

A comprehensive *home survey* was provided to all participating M3 LTC homes (n=32) at the study outset and was completed by the directors of care and food services managers (Keller et al., 2017b). The questionnaire items included aspects of food and meal service that are impacted by provincial policy (e.g., food budget allocation, dedicated dietitian clinical time), home-level policies (e.g., menu planning, staff training), and home characteristics (e.g., type of food production) (Keller et al., 2017b). Individual items of interest for the current analysis obtained from the home survey include: size of home (i.e., number of beds categorized as small, medium, large based on LTC sector industry standards); part of a chain corporation or independent; for-profit or not-for-

profit/charitable/municipal; part of a continuum of care (i.e., long-term care section of a continuing care retirement community) or a standalone residence; and any structural renovations to the home area within the past 5 years or not (Keller et al., 2017b).

4.3.4 Ethical considerations

Ethics approval was obtained from the ethics boards associated with all study investigators' affiliated universities: University of Waterloo (ORE#20056), University of Alberta (Pro00050002), University of Manitoba (J2014:139), Université de Moncton (1415–022), and University Hospital Network, University of Toronto (16-5051-DE). Some individual LTC homes were required to obtain additional ethics clearance by their local/regional committees. Study participants or substitute decision-makers provided written informed consent and assent to participate. Study protocol and ethics boards required research assistants to report instances of misconduct by care staff to home administrators, as well as to the research ethics board associated with the university conducting data collection within that LTC home.

4.3.5 Analysis

Bivariate associations between resident-, dining room-, and home-level characteristics with the RCC Practices and TF Practices scores were assessed using simple regression analysis.

Multivariable linear regression analysis was used to determine which resident-, dining room-, and home-level variables were associated with the dependent variables, RCC practices or TF practices. Separate fully adjusted models tested associations between theoretically relevant independent variables at resident, dining room and home levels with the outcomes of RCC and TF mealtime practices observed for individual M3 participants. R^2 was examined to determine total variance explained by the final models.

As noted in bivariate and multivariate analyses, RCC/TF practices with individual residents were associated with level of eating assistance required. Additional bivariate

analyses (i.e., chi-square, ANOVA) were conducted to describe the differences between resident-, dining-room, and home-level variables by resident levels of physical eating assistance. Chi-square analyses were also conducted to explore the associations between physical eating assistance required (i.e., "Never", "Sometimes", and "Often") and each of the 17 individual M-RCC items by RCC and TF Practices. Each RCC Practice or TF Practice item was dichotomized as either having occurred at least once over the three meal observations or not at all. It is probable that a resident could have experienced both RCC and TF versions of the same practice for some of these mealtime activities (e.g., included/excluded from staff member social conversations), even at a single meal, thus each practice was not mutually exclusive across all meal observations. Post hoc tests using Fisher exact contrasts identified significant differences between levels of eating assistance while controlling for multiple levels. Total RCC practices and TF Practices scores were also compared across the three levels of eating assistance using ANOVAs and post hoc Tukey tests. Data were analyzed using SAS® Studio version 3.5 (SAS Institute, Cary, NC, 2019). Statistical significance was determined at a level of $p<0.05$ for all analyses. Missing data were not imputed.

4.4 Results

Of the 639 residents included in the M3 study sample (Keller et al., 2017a), 634 (99.2%) were included in this study based on having complete M-RCC data (Table 4.1). Approximately one-third (31.1%) of residents were male and were an average age of 86.7 years (Standard Deviation [±] = 7.8). More than half of residents had moderate to severe cognitive impairment (55.7%; CPS>3) and 33.3% of residents were at risk or had a diagnosis of depression. Eating challenges were common amongst this sample, where more than half of residents were at risk or experienced dysphagia (59.2%), and half (49.4%) were found to have poor oral health that likely impacted their food intake. Almost one-quarter of residents (23.2%) required some form of physical eating assistance at meals. Dining room and home-level characteristics are also described in Table 4.1.

4.4.1 Differences in mealtime care provision at the resident-, dining room- and home-levels

Residents received a mean of 9.6±1.4 RCC practices and 5.6±2.1 TF practices at mealtimes (Tables 4.4 and 4.5). At the resident level, RCC practices were higher for residents with higher BMI and those with overall better nutritional status (Table 4.1). Residents received fewer RCC practices from staff during meals if they lived with moderate/severe cognitive impairment, had higher ADL scores (i.e., more dependent), risk of dysphagia, poor oral health, more eating challenges (Ed-FED-Q), requiring some form of physical eating assistance, or consuming more protein (g/day). The effect sizes of most of these associations with RCC score were small ($\beta<|1.0|$), with the exception of "often" requiring physical assistance: these individuals received -1.6 (95% CI=-1.93, -1.26) fewer RCC practices during meals as compared to those who did not require eating assistance. At the dining room level, residents eating in dining rooms with higher staff-to-resident ratios experienced more RCC practices. Dining rooms with higher numbers of residents requiring physical eating assistance or higher number of staff providing eating assistance were significantly associated with fewer RCC practices. At the home level, staff working in home areas that had undergone structural renovations within the last five years exhibited more RCC practices at mealtimes.

TF practices were observed significantly more often among those residents living with moderate to severe cognitive impairment (β=1.29 [95% CI= 0.98, 1.61], those who exhibited expressive behaviours, had higher ADL scores, a higher number of diagnoses, and those at risk of dysphagia (Table 4.1). Poor oral health that impacted food intake and overall eating challenges (Ed-FED-Q) were associated with more TF practices. Again, residents who were dependent on physical eating assistance "Sometimes" (β=1.6 [95% CI= 1.13, 2.08]) and "Often" (β=2.24 [95% CI= 1.77, 2.70]) experienced notably more TF practices. Dining rooms that had a higher number of residents who required physical eating assistance, had more staff involved in providing eating assistance or had more family members/volunteers present to assist residents with meals had more TF practices observed. Those dining rooms located within

specialized dementia home areas were found to have more TF practices from care staff. In addition, TF practices were observed more often in larger, for-profit, or chain homes that were part of a continuum of care. TF practices were lower among residents with higher BMIs (β=-0.06 [95% CI= -0.08, -0.03]), those who took more medication, better nutritional status, or were in dining rooms with higher staff-to-resident ratios.

Table 4.1. Comparison of resident characteristics, dining room characteristics, mealtime relational care, and home level characteristics by RCC Practices and TF Practices scores (N=634)

Variable	Total Sample Description	M-RCC Mealtime Care Practices	
	Mean (SD) / % (n)	RCC Practices β (95% CI)	TF Practices β (95% CI)
Resident-Level Characteristics			
Age	86.8 (7.8)	-0.003 (-0.02, 0.01)	0.02 (-0.001, 0.04)
Sex, Male	31.1% (199)	-0.22 (-0.46, 0.03)	-0.05 (-0.40, 0.30)
BMI	25.3 (5.7)	**0.03 (0.01, 0.05)***	**-0.06 (-0.08, -0.03)***
Cognitive Performance Scale Moderate to Advanced (3-6) (vs. low to moderate (0-2))	55.7% (353)	**-0.50 (-0.73, -0.27)***	**1.29 (0.98, 1.61)***
Aggressive Behaviours Scale	1.9 (3.1)	-0.03 (-0.06, 0.01)	**0.06 (0.01, 0.12)***
Depression Risk (vs. not as risk)	33.3% (213)	0.17 (-0.07, 0.42)	-0.28 (-0.63, 0.06)
Activities of Daily Living – Long Form	15.0 (7.9)	**-0.05 (-0.06, -0.03)***	**0.11 (0.09, 0.13)***
Total Number of Diagnoses	5.4 (2.0)	0.01 (-0.05, 0.06)	**0.10 (0.02, 0.18)***
Total Number of Medications	7.5 (3.4)	0.02 (-0.01, 0.05)	**-0.16 (-0.20, -0.11)***
Dysphagia Risk (vs. not at risk)	59.2% (378)	**-0.26 (-0.49, -0.03)***	**0.90 (0.58, 1.22)***
Oral Health Likely to Affect Food Intake (vs. good oral health)[a]	49.4% (280)	**-0.40 (-0.64, -0.17)***	**0.41 (0.08, 0.75)***
Total Ed-FED-Q Score	12.4 (2.3)	**-0.27 (-0.32, -0.22)***	**0.49 (0.43, 0.55)***

Level of Physical Eating Assistance
  'Sometimes' (vs. Never)
  'Often' (vs. Never)
	11.4% (72)
	11.8% (75)
		-0.48 (-0.82, -0.14)
		-1.60 (-1.93, -1.26)*
			1.60 (1.13, 2.08)
			2.24 (1.77, 2.70)*

3-day average energy Intake (kcal/day)	1553.5 (294.5)	-0.0001 (-0.0004, 0.0003)	-0.0002 (-0.0008, 0.0004)
3-day average protein intake (g/day)	57.4 (13.0)	**-0.01 (-0.02, -0.002)***	0.008 (-0.005, 0.02)
Mini-Nutritional Assessment - Short Form	10.6 (2.5)	**0.13 (0.09, 0.18)***	**-0.23 (-0.29, -0.17)***
Dining Room-Level Characteristics			
Number of residents requiring physical eating assistance at a meal	3.2 (2.7)	**-0.07 (-0.11, -0.03)**	**0.13 (0.07, 0.19)***
Number of staff involved in eating assistance	3.4 (2.2)	**-0.08 (-0.14, -0.03)**	**0.28 (0.22, 0.35)***
Ratio of residents per care staff involved in eating assistance[a]	7.7 (4.3)	**0.04 (0.01, 0.06)***	**-0.10 (-0.13, -0.05)***

Number of family members or volunteers involved in eating assistance	1.5 (1.5)	0.01 (-0.07, 0.09)	**0.15 (0.04, 0.26)****
Specialized Dementia Home Area (vs. general home area)	28.8% (184)	-0.01 (-0.26, 0.24)	**0.55 (0.20, 0.91)****
Home-Level Characteristics			
Large Home Size (>100) (vs. Small/ Medium (<99))	65.7% (420)	0.18 (-0.06, 0.42)	**0.88 (0.54, 1.21)*****
Home part of chain (vs. independent)	37.6% (240)	0.05 (-0.18, 0.29)	**0.64 (0.31, 0.97)*****
For profit (vs. not-for-profit / municipal)	31.5% (201)	0.13 (-0.11, 0.37)	**0.35 (0.001, 0.69)***
Home part of a continuum of care (vs. stand-alone home)	31.1% (199)	0.02 (-0.23, 0.26)	**0.87 (0.52, 1.21)*****
Structural Renovation in past 5 years (vs. no renovation in past 5 years)	20.2% (127)	**0.30 (0.02, 0.58)***	-0.008, (-0.41, 0.39)

RCC= Relationship-Centred Care, TF=Task-Focused. Statistically significant at *p<0.05; ** p<0.01; ***p<0.001.
a = Missing data: oral health n=565; ratio of resident per care staff involved in eating assistance n=564.

The multivariable regression models identified significant factors associated with RCC practices and TF practices after adjusting for theoretical modeled covariates (Table 4.2). Four factors were associated with <u>both</u> RCC and TF practices, but in the opposite directions; these were structural renovations within the home area in the past 5 years, sex (male), ADL scores, and residents who required eating assistance "Often". Homes that had undergone structural renovations in home areas were associated with more RCC practices (β=0.68 [95% CI= 0.32, 1.04]) and fewer TF practices (β=-0.94 [95% CI= -1.35, -0.50]). Being male was associated with fewer RCC practices (β=-0.39 [95% CI= -0.65, -0.13]) and more TF practices (β=0.34 [95% CI= 0.03, 0.66]). Residents with higher ADL scores experienced more frequent TF practices (β=0.08 [95% CI= 0.06, 1.11]) and fewer RCC practices (β=-0.02 [95% CI= -0.04, -0.0004]). Requiring eating assistance "Often" was associated with both fewer RCC practices (β=-1.34 [95% CI= -0.81, -0.88]) and more TF practices (β=1.22 [95% CI= 0.67, 1.77]). In addition to these covariates that identified opposing associations between TF and RCC practices, some covariates were only associated with RCC or TF mealtime practices. For-profit homes were associated with more RCC practices, while having poor oral health was associated with fewer RCC practices. These were the only other variables associated with RCC when adjusting for covariates. Several variables were only associated with TF practices.

Specifically, TF practices were higher in large homes and homes attached to continuums of care, as well as in dining rooms where there were a higher number of staff involved in eating assistance. At the resident-level, those who were at risk of dysphagia were more likely to experience TF practices, and those residents with more medications were less likely to receive TF practices from staff. The fully adjusted models explained 24.1% of the variance in RCC practices and 45.2% of the variance in TF practices.

Table 4.2. Multivariable regression models testing the association between home-, dining room-, and resident-level variables with RCC and TF Practices as outcomes (N=634)

Variable	RCC Practices β (95% CI)	TF Practices β (95% CI)
Home-Level Characteristics		
Large Home Size (>100) (vs. Small/ Medium (<99))	-0.05 (-0.36, 0.25)	**0.54 (0.18, 0.90)****
Home part of chain (vs. independent)	0.01 (-0.37, 0.39)	0.19 (-0.26, 0.64)
For profit (vs. not-for-profit / municipal)	**0.57 (0.21, 0.93)****	-0.17 (-0.60, 0.26)
Home part of a continuum of care (vs. stand-alone home)	0.03 (-0.29, 0.34)	**0.94 (0.56, 1.31)*****
Structural Renovation in past 5 years (vs. no renovation in past 5 years)	**0.68 (0.32, 1.04)*****	**-0.92 (-1.35, -0.50)*****
Dining Room-Level Characteristics		
Number of residents requiring physical eating assistance at a meal	-0.04 (-0.13, 0.04)	-0.10 (-0.20, 0.005)
Number of staff involved in eating assistance	-0.04 (-0.15, 0.06)	**0.26 (0.13, 0.39)*****
Ratio of residents per care staff involved in eating assistance[a]	-0.02 (-0.06, 0.01)	-0.008 (-0.05, 0.03)
Number of family members or volunteers involved in eating assistance	0.09 (-0.09, 0.18)	-0.03 (-0.14, 0.09)
Specialized Dementia Home Area (vs. general home area)	0.21 (-0.09, 0.51)	0.11 (-0.24, 0.46)
Resident-Level Characteristics		
Age	0.001 (-0.2, 0.02)	0.008 (-0.01, 0.03)
Sex, Male	**-0.39 (-0.65, -0.13)****	**0.34 (0.03, 0.66)***
Body Mass Index	0.02 (-0.003, 0.04)	-0.01 (-0.04, 0.01)
Cognitive Performance Scale Moderate to Advanced (3-6) (vs. low to moderate (0-2))	-0.03 (-0.33, 0.28)	0.19 (-0.17, 0.55)
Aggressive Behaviours Scale	-0.01 (-0.06, 0.03)	-0.00002 (-0.06, 0.05)
Depression Risk (vs. not at risk)	0.05 (-0.23, 0.32)	-0.04 (-0.37, 0.28)
Activities of Daily Living – Long Form	**-0.02 (-0.04, -0.0004)***	**0.08 (0.06, 1.11)*****
Total Number of Diagnoses	-0.02 (-0.08, 0.05)	0.06 (-0.01, 0.14)
Total Number of Medications	0.007 (-0.03, 0.05)	**-0.08 (-0.13, -0.03)****
Dysphagia Risk (vs. not at risk)	-0.19 (-0.45, 0.06)	**0.36 (0.06, 0.66)***

Oral Health Likely to Affect Food Intake[a]	**-0.25 (-0.50, -0.004)***	-0.01 (-0.30, 0.28)
Level of Physical Eating Assistance		
'Sometimes' (vs. Never)	-0.28 (-0.68, 0.13)	0.40 (-0.08, 0.88)
'Often' (vs. Never)	**-1.34 (-1.81, -0.88)***	**1.22 (0.67, 1.77)***

RCC= Relationship-Centred Care, TF=Task-Focused. Statistically significant at *$p<0.05$; ** $p<0.01$;
***$p<0.001$.
a = Missing data: oral health n=565; ratio of resident per care staff involved in eating assistance n=564.

4.4.2 Resident Characteristics Associated with Level of Required Eating Assistance

Level of eating assistance was highly associated with RCC and TF practices. To understand the characteristics of residents requiring eating assistance further, bivariate analyses between eating assistance and resident, dining room and home-level variables was undertaken. In general, residents who required physical assistance during meals experienced greater challenges including more severe cognitive impairment, risk of dysphagia, risk of malnutrition, and less independence on ADLs, and these challenges were typically most pronounced among residents who "Often" required assistance (Table 4.3). An exception to this was responsive behaviours (i.e., ABS score), which were the highest among those residents who "Sometimes" needed assistance. Further, total number of diagnoses and total number of medications were significantly higher amongst those who ate independently compared to the other two groups. Residents who required physical eating assistance were more likely to eat in dining rooms on specialized home areas with more residents who required eating assistance, but also more staff to support eating assistance. Home-level characteristics were not associated with levels of eating assistance required.

Table 4.3. Comparison of resident-, dining room-, mealtime relational care, and home-level characteristics across levels of resident eating assistance (N=634)

Variable	Ed-FED-Q Question: "Does this resident require physical help with feeding/eating?"		
	Never (n=487)	Sometimes (n=72)	Often (n=75)
Resident-Level Characteristics			
Age, years (SD)	86.9 (7.6)	87.3 (8.7)	85.4 (8.5)
Gender, Male %(n)	32.9% (160)	29.2% (21)	24.0% (18)

BMI, mean (SD)	26.1 (5.7)[a]	23.2 (5.5)[b]	22.4 (4.7)[b]
Cognitive Performance Scale Moderate to Advanced (3-6) (vs. low to moderate (0-2)) %(n)	44.1% (213)[a]	87.5 (63)[b]	98.7% (73)[c]
Aggressive Behaviours Scale, mean (SD)	1.7 (2.9)[a]	3.0 (3.9)[b]	2.1 (2.9)[a,b]
Depression Risk% (n)	34.7% (169)	30.6% (22)	25.3% (19)
Activities of Daily Living Scale, mean (SD)	12.5 (6.9)[a]	20.7 (5.0)[b]	25.2 (3.8)[c]
Total Number of Diagnoses, mean (SD)	5.6 (2.0)[a]	5.1 (1.9)[a,b]	4.8 (2.1)[b]
Total Number of Medications, mean (SD)	7.8 (3.5)[a]	6.3 (3.2)[b]	6.3 (3.1)[b]
Dysphagia Risk % (n)	56.5% (275)[a]	70.8% (51)[b]	66.7% (50)[a,b]
Oral Health Likely to Affect Food Intake % (n)	46.7% (207)	56.5% (35)	60.0% (36)
Mini-Nutritional Assessment, mean (SD)	11.2 (2.2)[a]	9.3 (2.9)[b]	8.2 (2.3)[c]
Leaving dining room/walking during any meal %(SD)	3.9% (19)	5.6% (4)	2.7% (2)
Dining Room-Level Characteristics			
Number of residents requiring physical eating assistance at a meal, mean (SD)	2.9 (2.6) [a]	3.7 (2.4) [b]	4.8 (3.2) [c]
Number of staff involved in eating assistance, mean (SD)	3.1 (2.3)[a]	4.1 (2.1)[b]	4.2 (1.4)[b]
Ratio of residents per care staff involved in eating assistance, mean (SD)	8.3 (4.6)[a]	6.3 (3.1)[b]	5.5 (2.6)[b]
Number of family members or volunteers involved in eating assistance, mean (SD)	1.5 (1.5)	1.5 (1.5)	1.8 (1.5)
Specialized Dementia Home Areas (vs. general home area) (n)	25.9% (126)[a]	33.3% (24)[a,b]	44.0% (33)[b]
Home-Level Characteristics			
Large Home Size (>100) (vs. Small/ Medium (<99)) (n)	67.2% (327)	70.8% (51)	54.7% (41)
Home part of chain (vs. independent) (n)	38.0% (185)	45.8% (33)	29.3% (22)
For profit (vs. not-for-profit / municipal) (n)	31.2% (152)	40.3% (29)	26.7% (20)
Home part of a continuum of care (vs. stand-alone home) (n)	29.6% (144)	34.7% (25)	37.3% (28)
Structural Renovation in past 5 years (vs. no renovation in past 5 years) (n)	19.7% (95)	18.6% (13)	26.4% (19)

[a, b, c] statistically different at $p>0.05$

4.4.3 Differences in Mealtime Care Provisions based on Resident Level of Required Eating Assistance

Requiring eating assistance was highly associated with RCC and TF practice scores in bivariate and multivariable analyses. To further explore the types of interactions at mealtimes, the three categories of eating assistance were compared. The total score for RCC practices was significantly different: as the level of eating assistance required increased, the number of RCC interactions between residents and staff decreased ("Never" 9.9±1.3 vs. "Sometimes" 9.4±1.5 vs. "Often" 8.3±1.6, $F_{(2, 631)}=45.77$, p <.0001) (Table 4.4). It was found that residents who required any level of eating assistance ("Sometimes" 6.7±1.8 and "Often" 7.4±2.4, $F_{(2, 631)}=59.63$, $p<.001$)

received significantly more TF practices than those who ate independently ("Never" 5.1±1.8) (Table 4.5). Significant differences in several of the individual RCC and TF practice items from the M-RCC Checklist were found across the three different levels of resident eating assistance (Table 4.4 and 4.5). In general, residents who "Sometimes" or "Often" required physical eating assistance were both significantly more likely to receive TF practices and significantly less likely to receive RCC practices than those who "Never" required assistance, for example not being asked meal preferences, not being asked permission before an action was taken, and being rushed to leave the dining room when finished. These two resident groups were more likely to be restrained and forced/coerced to eat compared to those who ate independently. These were rare practices only seen in 10.6% and 5.5% of participants, respectively. Each resident who "Often" required eating assistance was not asked permission and/or advised that a clothing protector was being put on them during at least one meal observation. Social engagement also significantly differed between these resident groups, where those who required any level of physical eating assistance were more likely to be excluded from social conversations with staff and not talk with tablemates, as compared to residents who "Never" needed assistance. Residents who ate independently were least likely to receive non-verbal social interaction from staff as compared to those who received assistance. Residents who "Sometimes" needed eating assistance were statistically distinct from the two other groups in terms of eating and drinking at the table with staff. For this group, staff were more likely to eat and drink with these residents as compared to those who "Often" needed support and those who ate independently. In general, this social activity was infrequent at 7.4% of participants (Table 4.4). Discouragement in participation in mealtime processes, including the act of self-feeding, was significantly different between each of these three groups, with discouragement increasing as the level of required eating assistance increased.

Table 4.4. Comparison of individual RCC Practice items across different levels of resident eating assistance requirements (N=634)

#	M-RCC Individual RCC Practices, % (n)	Total M3 Sample N=634	Ed-FED-Q Item: "Does this resident require physical help with feeding/eating?"

		Never = 487	Sometimes = 72	Often = 75
1	Are given a choice / not assigned seating, (n)	19.2% (121)	19.6% (95)	20.8% (15)	14.9% (11)
2	Request or are asked if they want a clothing protector or if it should be put on, (n)[1]	26.2% (145)	28.8% (117)	22.5% (16)	16.0% (12)
3	Are not restrained, (n)	94.6% (600)	**97.1% (473)[a]**	**91.7% (66)[b]**	**81.3% (61)[b]**
4	Are asked meal preference, (n)	64.7% (410)	**71.1% (346)[a]**	**45.8% (33)[b]**	**41.3% (31)[b]**
5	Are provided food quickly, (n)	95.9% (607)	96.1% (467)	95.8% (69)	94.7% (71)
6	Do not receive medications at meals, (n)	75.1% (476)	74.3% (362)	76.4% (55)	78.7% (59)
7	Are informed of actions before taken, (n)	95.7% (605)	**97.7% (474)[a]**	**94.4% (68)[a,b]**	**84.0% (63)[b]**
8	Are discreetly excluded from staff's process-related conversations (e.g., staff quietly discuss a resident's food selection or diet type), (n)	93.5% (433)	**95.0% (326)[a]**	**91.9% (57)[a,b]**	**86.2% (50)[b]**
9	Are included in social conversation with staff (e.g., staff engage nearby residents during their conversations), (n)	44.6% (233)	**50.7% (196)[a]**	**28.4% (19)[b]**	**26.1% (18)[b]**
10	Receive non-verbal social interaction from staff (e.g., smile, touch hand), (n)	90.5% (574)	89.9% (438)	90.3% (65)	94.7% (71)
11	Have some talk with tablemates, (n)	56.7% (364)	**64.6% (308)[a]**	**39.7% (27)[b]**	**16.9% (11)[c]**
12	Are addressed respectfully, (n)	100% (634)	100% (487)	100% (72)	100% (75)
13	Eat or drink at the table with staff, (n)	7.4% (35)	**5.6% (20)[a]**	**16.1% (10)[b]**	**9.4% (5)[a,b]**
14	Are allowed to determine if they want to eat, (n)	99.2% (629)	**100% (487)[a]**	**98.6% (71)[a,b]**	**94.7% (71)[b]**
15	Are permitted to linger in dining area, (n)	99.5% (629)	99.8% (485)	98.6% (71)	98.7% (74)
16	Receive assistance when they want to leave, (n)[2]	72.4% (267)	73.3% (167)	71.2% (47)	70.7% (53)
17	Are allowed to be involved in mealtime tasks (including self-feeding), (n)	94.7% (588)	**100% (487)[a]**	**97.2% (70)[b]**	**50.0% (31)[c]**
	Total RCC Practices, mean (SD)	9.6 (1.4)	**9.9 (1.3)[a]**	**9.4 (1.5)[b]**	**8.3 (1.6)[c]**

RCC= Relationship-Centred Care

[1]If there were no clothing protectors, item was marked as "N/A".

[2]If no resident required eating assistance, item was marked as "N/A".

N values in brackets do not add up to the total M3 sample as residents would have experienced both relationship-centred and task-focused practices across all meal observations.

[a, b, c] values with different letter superscripts are statistically different at $p < 0.05$; statistically significant differences are also bolded.

Table 4.5. Comparison of individual TF Practice items across different levels of resident eating assistance requirements (N=634)

#	M-RCC Individual TF Practices, % (n)	Total M3 Sample N=634	Ed-FED-Q Item: "Does this resident require physical help with feeding/eating?"		
			Never = 487	Sometimes = 72	Often = 75
1	Are told where to sit/assigned seating, (n)	89.9% (567)	90.1% (437)	87.5% (63)	90.5% (67)
2	Clothing protector is put on (no asking), (n)[1]	93.0% (514)	**91.2% (371)[a]**	**95.8% (68)[a,b]**	**100% (75)[b]**
3	Are restrained, (n)	10.6% (67)	**7.0% (34)[a]**	**19.4% (14)[b]**	**25.3% (19)[b]**
4	Are not asked meal preference, (n)	64.5% (409)	**60.0% (292)[a]**	**80.6% (58)[b]**	**78.7% (59)[b]**
5	Have a long wait to get food, (n)	38.9% (246)	39.5% (192)	34.7% (25)	38.7% (29)
6	Receive medications at meals, (n)	82.5% (523)	83.4% (406)	76.4% (55)	82.7% (62)
7	Are not informed of actions before taken, (n)	39.9% (252)	**36.3% (176)[a]**	**50.0% (36)[a,b]**	**53.3% (40)[b]**
8	Are blatantly excluded from staff's process-related conversations (e.g., staff loudly discuss a resident's food selection or diet type), (n)	30.7% (142)	29.2% (100)	32.3% (20)	37.9% (22)
9	Are not included in social conversations with staff (e.g., staff ignore nearby residents during their conversations), (n)	86.0% (450)	**82.4% (319)[a]**	**97.0% (65)[b]**	**95.7% (66)[b]**
10	Receive no non-verbal social interaction from staff, (n)	45.4% (287)	**48.7% (237)[a]**	**38.9% (28)[a,b]**	**29.3% (22)[b]**
11	Do not talk to tablemates, (n)	79.0% (482)	**74.2% (354)[a]**	**94.1% (64)[b]**	**98.5% (64)[b]**
12	Are not addressed respectfully, (n)	11.2% (71)	10.9% (53)	11.1% (8)	13.3% (10)
13	Do not eat or drink at the table with staff, (n)	97.7% (460)	**98.9% (352)[a]**	**91.9% (57)[b]**	**96.2% (51)[a,b]**
14	Are forced/coerced to eat, (n)	5.5% (35)	**2.3% (11)[a]**	**15.3% (11)[b]**	**17.3% (13)[b]**
15	Are rushed to leave dining area, (n)	9.2% (58)	**5.8% (28)[a]**	**19.4% (14)[b]**	**21.3% (16)[b]**
16	Wait to get assistance to leave, (n)[2]	59.6% (220)	58.8% (228)	63.6% (42)	58.7% (75)
17	Are discouraged from mealtime tasks (including self-feeding), (n)	13.2% (82)	**2.9% (14)[a]**	**34.7% (25)[b]**	**69.4% (43)[c]**
	Total TF Practices, mean (SD)	5.6 (2.1)	**5.1 (1.8)[a]**	**6.7 (1.8)[b]**	**7.4 (2.4)[b]**

TF = Task-Focused
[1]If there were no clothing protectors, item was marked as "N/A".
[2]If no resident required eating assistance, item was marked as "N/A".

4.5 Discussion

Mealtimes in LTC homes involve complex processes that can support or hinder caring and relational connections between those who live and work in these environments. This study sought to examine first, the independent associations between multi-level factors and care practices during mealtimes in Canadian LTC homes, and second, whether differences in care provision exist based on residents' required level of physical eating assistance. Our results indicate that care provision at meals is influenced by resident-, dining room-, and home-level factors. RCC practices were more common in these homes than TF practices. Below we discuss these different levels of factors and, where plausible, suggest interplay among the levels based on our multivariable analyses.

Findings from our study indicate that resident-level characteristics are strongly associated with the type of care received from staff at mealtimes. Residents who are prescribed more medications received fewer TF practices, which may be in part due to polypharmacy being common among younger or cognitively aware LTC residents who are less reliant on eating assistance as compared to their older, more dependent counterparts (Bronskill et al., 2012). Fewer RCC practices, as well as more TF practices were independently associated with male residents, which brings into question gender differences within the context of relational care. Research has shown that male residents living with dementia initiate more interactions with staff than female residents, while female staff initiate more interactions with male residents than female residents. Further, male residents are more likely to be socially isolated which could be a result of family factors (e.g., divorce) (Chamberlain et al., 2020). We contend that male residents may depend more heavily on mealtimes for social interactions and their demands may be met by more TF responses from staff. This may occur more frequently in dining rooms with more residents who require eating assistance where there are more staff involved in providing this assistance, and thus may feel especially rushed and have less capacity to respond in relationship-centred ways to the needs of male residents. Future research should explore gender differences using an intersectional lens within the context of relational mealtimes in LTC environments.

Residents who face any form of eating challenge, including increased ADL dependence, dysphagia risk, and poor oral health received significantly more TF practices and fewer RCC practices. Varying levels of eating challenges among residents between meals has been noted as a barrier to optimizing eating performance and positive staff engagement. Liu and colleagues (2020) reported that nursing assistants found it frustrating to balance resident autonomy at mealtimes with fluctuating physical and cognitive functions that required increased verbal and physical prompting. Most notably are the differences in care received by those residents who are most dependent on staff: the highest level of eating assistance (i.e., "Often") was the strongest predictor of residents receiving the fewest RCC practices and the most TF practices at meals. We know from previous research that residents with eating challenges have lower nutritional intake in both protein and energy (Keller et al., 2017a; Carrier et al., 2007). With added pressure to ensure residents are eating a sufficient amount of food, staff may adopt problematic means to fulfill this responsibility and neglect attending to social aspects of meals. For example, more staff involved in eating assistance - the only dining room level variable associated with TF practices in multivariable analyses - could speak to further eating challenges experienced by those who 'Often' required eating assistance, such as food refusal or turning their heads away, that results in more TF interactions.

Differences in the types of care practices observed among residents based on their level of eating assistance provides further understanding of this issue (Tables 4.4 and 5.5). Analysis of individual M-RCC items indicate that residents who require eating assistance are afforded little agency over their mealtime and experience fewer social interactions with both staff and residents. Residents who "Often" require eating assistance had fewer exchanges with tablemates and were discouraged from participating in mealtime tasks, including self-feeding, compared to residents who "Sometimes" required assistance. Discouraging residents from participating in self-feeding can result in the development of "excess disability" around eating independence, meaning a loss in ability to perform the task for oneself attributed to external factors (Batchelor-Murphy et al., 2017; Slaughter et al., 2011). Slaughter and colleagues (2011) found that 40% of Canadian LTC residents living with dementia

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experienced challenges with eating, yet half of these challenges were a result of excess disability and could have been prevented. Excessive or unnecessary eating assistance from staff - regardless of the resident's level of eating ability - can accelerate excess disability by diminishing resident propensity to eat independently, hindering their sense of control over meals, thus decreasing enjoyment which can result in (warranted) resistive and/or expressive behaviours to others (Amella, 2002; Gibbs-Ward & Keller, 2005; Gilmore-Bykovski et al., 2015; Liu et al., 2015). This could also explain the association seen with number of staff involved in mealtime eating assistance; the urgency to 'finish off the meal' could have resulted in staff providing unnecessary assistance. Interventions focused on supporting residents with eating challenges should focus beyond nutritional intake and include relational aspects of this interaction that go beyond the dyad to include the impact of dining room- and home-level factors (Abdelhamid et al., 2016; Liu et al., 2015).

Our study found that about 6% of residents were coerced or forced to eat at least once during meal observations, with those who "Sometimes" or "Often" required eating assistance more likely to experience this event. This is a troubling finding, in particular because almost all residents in this sample who required eating assistance were living with advanced dementia and would not be able to advocate for themselves. Coercion to eat and force feeding within LTC are not explicitly discussed in the research literature, despite mealtimes and eating assistance being fairly well-studied phenomena. There is some indication of verbal and psychological abuse during mealtimes as tactics to ensure sufficient resident food intake (Palese et al., 2019a; Hung & Chaudhury et al., 2011). The implications surrounding coercion to eat or force feeding are profound and the most extreme form of TF practices, as they are a clear violation of resident rights and ethical principles of care. At the same time, staff are faced with the ethical dilemma of respecting a resident's self-determination to refuse food that may ultimately lead to undernutrition (Österholm et al., 2015). As mentioned previously, coercive tactics, in addition to other TF practices, may be a consequence of staff expediting mealtime processes due to complex resident care needs and low staffing levels (Lowndes et al., 2018; Hung & Chaudhury, 2011). There may also be an interplay with the size of home,

as seen in our multivariable analyses. Larger homes may have challenges with consistent staffing, understaffing, and often have larger dining rooms, all of which would necessitate procedures to promote efficiency that can result in TF practices. Establishing clear boundaries between acceptable and abusive eating assistance approaches on an on-going basis is required from home leadership, in addition to addressing specific multi-level factors that contribute to situations where staff feel compelled to use TF and unethical tactics to increase resident food intake (Palese et al., 2019a).

Recent structural renovations in these home areas were associated with more positive resident-staff interactions and also with fewer TF practices. The physical design of a LTC home has been shown to have significant influence on everyday lives of residents and staff. For example, creating smaller dining spaces or modifying flooring to reduce glare can ease the need for residents' physical and/or cognitive competence required to navigate in these spaces (Chaudhury et al., 2013; Lawton & Nahemow, 1973; Nordin et al., 2017). It can be hypothesized that homes that made financial investments to improve the physical environment were also invested in changing their social and organizational environments to improve the quality of life for resident and working environment for staff, which may have translated to better RCC at mealtimes (Chaudhury et al., 2018). As noted in a recent evaluation of a mealtime intervention, improving the physical dining environment is often a consistent source of motivation needed to kick-start organizational and staff-level changes at mealtimes (Keller et al., 2020).

For-profit status was also associated with more RCC practices, a finding that is contradictory to much of the literature that speaks to the varying levels of quality of care associated with for-profit homes (Bos et al., 2016; Hsu et al., 2016; Huang & Bowblis, 2018). However, "for-profit" status may be a crude indicator of the complexity of ownership structures within this sector and their association with quality outcome measures (e.g., Kruse et al., 2021). It has been suggested that salaried administrators of large for-profit homes may have little control over standardized policies and

profitability goals that result in measures such as reducing staffing and thus quality levels, whereas smaller for-profit homes where administrators have significant equity stakes (i.e., owner-managers) may be more responsive to long-run financial performance goals, including reputation of quality of care, training of staff on RCC or person-centred care practices, and maintaining higher staffing levels (Castle, 2001; Harrington et al., 2015; Huang & Bowblis, 2018; Stevenson et al., 2013). This association between RCC and for-profit status may explain the lack of association among dining room-level characteristics and RCC practices noted in multivariable analyses. It should also be noted that those for-profit LTC homes involved in the M3 Study (for profit=10; non-profit=22) may be outliers, as their willingness to participate could indicate an organizational culture that supports innovation and quality of care improvements.

Larger homes (+100 beds) or homes that are part of continuums of care were associated with more TF practices. This is consistent with what has been observed within Canada's LTC sector and what has been reported in the literature (Parker et al., 2004; Torrington, 2007). Berta and Laporte (2010) reported that directors of care of LTC homes found managing larger facilities more challenging, as there is a greater emphasis on operational efficiency (i.e., cost reducing strategies), as compared to their counterparts in smaller homes. By the same token, directors of care at smaller homes explained that the size of their home was more conducive to staff-resident relationships and better emotional care (Berta & Laporte, 2010). Large LTC homes may adopt standardization of work, quantifying "best practices" to promote efficiencies, and in doing so, reduce the ability for responsive staff-resident interactions that are preconditions to RCC practices, especially those that are needed at mealtimes (Baines & Armstrong, 2018). Being part of chain was not independently associated with either RCC or TF practices, which is inconsistent with research that indicates this characteristic to be associated with fewer hours of direct resident care (Hsu et al., 2016) and higher number of reported deficiencies (Harrington et al., 2017; McGregor et al, 2011). However, it appears from this analysis that home size and continuums of care are more relevant with respect to dining practices. Post hoc bivariate analyses in this

data set found that homes that were part of continuums of care were more likely to be for-profit status ($\chi2(1) = 61.41$, $p < .0001$) or a chain home ($\chi2(1) = 39.75$, $p < .0001$). Large homes were not associated with for-profit status but were significantly associated with being part of a chain ($\chi2(1) = 52.89$, $p < .0001$). There is a paucity of literature that examines the association between LTC homes attached to continuums of care and quality of care provided. Future research should look to understand how shared centralized services between the different levels of care offered within these "campuses" impacts resident quality of life, mealtimes care, and staff job satisfaction.

Findings from this study suggest that the innermost mealtime interactions between staff and residents in LTC are shaped by meso- and macro-level factors, including the built environment (e.g., size of home, structural renovations), funding policies and regulations (e.g., profit status, meal timing), and the marketization (e.g. continuums of care) of the Canadian LTC system, but are also greatly affected by resident-level factors that require specialized care at mealtime (e.g. functional impairment, dysphagia risk, need for eating assistance). Given the variation in LTC homes across Canada, the ways in which multi-level factors interact with one another to promote relationship-centred or task-focused mealtimes, are for the most part, context-dependent. However, results from this study indicate clear linkages between macro-level factors and their associations with the type of care being provided by staff to residents with complex mealtime care needs. It is for these vulnerable residents that staff require a supportive organizational culture that understands that additional time and training are needed to ensure not only adequate resident food and fluid intake, but importantly individualized interactions that reinforce social care and the relational autonomy of both staff and residents.

Within Canada, some LTC homes have responded to the culture change movement by formally adopting social models of care with the intention to improve organizational culture and quality of care, such as during mealtimes. For this transition to take place, home leadership must embrace the idiosyncratic nature of individualized care and the autonomy of staff to enact its principles (Rockwell, 2000). Yet, continued pressure to

standardize mealtime care that can be task-focused, repetitive, and aimed at increasing efficiency and lowering costs, means that these social models are simply being laid atop a deeply embedded biomedical model (Donnelly & MacEntee 2016; Rockwell, 2000). This phenomenon may be most evident in implementation studies that look to support LTC homes with adopting social models of care (Ducak et al., 2015; Scalzi et al., 2006; Wu et al., 2018). For example, Keller and colleagues (2020) implemented a complex intervention aimed at creating RCC mealtimes in 3 LTC homes over a 12-month period with support of an external facilitator. While significant improvements were observed in all participating homes, the degree to which improvements were made and sustained depended markedly on the willingness or reluctance of the home's leadership and organizational culture to embrace RCC philosophy and mealtime practice change (Keller et al., 2020; Gibson & Barsade, 2003).

The adoption of social models of care and the culture change movement can no longer exist as rhetoric, and the onus to adopt these changes cannot exclusively depend on staff, residents, and families. Simply put, for mealtimes to improve, the system must change. Governments need to determine how to measure, reward, and reinforce social models of care and support the configuration of the physical spaces of homes necessary to support this type of care (e.g., smaller absolute size). Low staffing levels paired with a lack of mandated minimum care standards remains an on-going issue in many provinces. Left unaddressed, the increasing numbers of residents with complex care needs with insufficient supports will continue to perpetuate the current system to the detriment of residents and staff well-being (Daly, 2015). Researchers undertaking implementation studies focused on changing practice to improve the mealtime experience should consider the impact of multi-level factors that facilitate or hinder practice change-uptake. Policy makers need to accept the trade-off that exists between quality care (e.g., RCC practices and minimum staffing ratios) and funding necessary to protect and support relationship-centred mealtimes in Canada's LTC homes (McGregor & Harrington, 2020).

4.5.1 Limitations

This study is the first, or one of the first, studies to explore multi-level factors associated with mealtime care provision within Canadian LTC homes. Although the M3 study was a large and comprehensive analysis of food intake and mealtime environments in 32 LTC homes across Canada; there are limitations to this work. First, the cross-sectional design of this study prevents conclusions related to causality between multi-level factors and care practices. Second, the purposive sampling of LTC homes in four Canadian provinces did not result in a representative sample of each province's LTC sector profiles. For instance, though Ontario has the highest number of for-profit homes in Canada, only 6.3% of the total resident sample lived in a for-profit home within that province. Third, while research assistants were rigorously trained to conduct observations using the M-RCC, inter-rater reliability testing was not possible prior to data collection and subjective differences in ratings may have affected interpretations of care interactions between staff and residents. Nevertheless, the M-RCC has previously demonstrated reliability (Keller et al., 2018). Fourth, the reciprocal element of RCC was not captured in the M-RCC from the resident's perspective. We recognize the oversimplistic nature of qualifying a care interaction as simply RCC or TF without recognizing resident roles in mealtime exchanges in this study. It is important to account for contextual factors that help to explain social interactions during mealtimes in LTC homes. Furthermore, the amount of variance explained by the covariates for RCC and TF practices varied (24% and 45% respectively), although the average score for RCC practices was higher than for TF practices. In the M3 study, factors associated with poor food intake were largely the focus of data collection (e.g., eating challenges, dysphagia risk, health conditions etc.). Covariates that could support and explain why RCC practices occur (e.g., training of staff in culture change, leadership style, etc.) were not assessed. This exploratory analysis does a better job of explaining why TF practices occur in LTC homes, but further study is needed to understand more fully the resident, dining room and home factors that can result in RCC practices. Future work examining mealtimes should consider how RCC social interactions can be encouraged.

4.6 Conclusion

Mealtimes in LTC settings play an important role in supporting resident physiological and psychological well-being and help to reinforce a sense of community between those who live and work in these settings. This study explored the factors at the home-, dining room-, and resident-level that were associated with mealtime care practices. TF practices are driven by home size, continuum of care and resident-level factors including being male and being more dependent at mealtimes. RCC practices are associated with residents being female and more independent, as well as living in a for-profit home or one that was recently renovated. Dining-room level characteristics were rarely associated with mealtime practices; more staff involved in eating assistance was associated with more TF practices. Our findings further our understanding on the long-standing disruption between promoting philosophies of social care and their translation into every-day mealtime practices. To create relationship-centred mealtimes, the focus for improvement must not only include the needs of residents, but also the needs of those providing care. Governments, policy makers, and researchers must recognize that these two conditions are contingent upon the other if we are to continue to move forward in improving the lives of those who live and work in Canada's LTC homes.

Chapter 5: Part 2: Manuscript 2: Family member eating assistance and food intake in long-term care: A secondary data analysis of the M3 Study

Manuscript published in *Journal of Advanced Nursing.*

5.1 Overview

Aim: To determine if protein and energy intake is significantly associated with a family member providing eating assistance to residents in long-term care homes as compared with staff providing this assistance, when adjusting for other covariates.

Background: Who provides eating support has the potential to improve resident food intake. Little is known about family eating assistance and if this is associated with resident food intake in long-term care.

Design: Cross-sectional, secondary data analysis.

Methods: Between October - January 2016, multi-level data were collected from 32 long-term care homes across four Canadian provinces. Data included 3-day weighed/observed food intake, mealtime observations, physical dining room assessments, health record review and staff report of care needs. Residents where family provided eating assistance were compared with residents who received staff-only assistance. Regression analysis determined the association of energy and protein intake with family eating assistance versus staff assistance while adjusting for covariates.

Results: Of those residents who required any physical eating assistance (N= 147), 38% (N=56) had family assistance during at least one of nine meals observed. Residents who received family assistance (N=56) and those who did not (N= 91) were statistically different in several their physiological eating abilities. When adjusting for covariates,

family assistance was associated with significantly higher consumption of protein and energy intake.

Conclusion: Energy and protein intake is significantly higher when family provides eating assistance. Family are encouraged to provide this direct care if it is required.

5.2 Impact

Residents who struggle with independent eating can benefit from dedicated support during mealtimes. Findings from this study provide empirical evidence that family eating assistance is associated with improved resident food intake and provides strong justification to encourage families to be active partners in the care and well-being of their relatives. Home administrators and nursing staff should support the specialized care that families can provide at mealtimes.

5.3 Introduction

Mealtimes are an essential ritual for families living with dementia and an important activity for connecting with others (Keller et al., 2010). In long-term care (LTC) homes, mealtimes have considerable potential to foster and reinforce relationships (Campo & Chaudhury, 2012). Yet, LTC mealtimes often remain task-focused and are stressful for care staff and residents. Factors such as high nursing staff and leadership turnover, combined with staff burnout, job dissatisfaction and increasing complex-care residents can make the delivery of person-centered care and socially connective mealtime experiences, a lower priority to essential meal service processes (Henkusens et al., 2014; Watkins et al., 2017; Wu, 2015).

Residents of LTC are at high risk of malnutrition, which can lead to hospital readmission, functional and cognitive decline, increased morbidity and mortality and higher health care expenditures (Barker et al., 2011; Neyens et al., 2013; Wirth et al., 2016). In a systematic literature review, Bell and colleagues (2013) reported prevalence of malnutrition ranging from 47- 61% among LTC residents. Similar findings were

reported by Keller et al., (2017a), where almost half of Canadian residents (44%) were found to be malnourished and eating challenges were associated with this malnutrition. Eating challenges are common and often coincide with cognitive impairment (Carrier, Ouellet & West, 2007; Neumann et al., 2001). Eating support to ensure adequate food intake at mealtimes is essential to maintaining the well-being of these residents.

There is increasing awareness that the quality of eating support provided to residents is important. A recent Canadian study found that the more person-centered mealtime care is, the more energy residents consume (Keller et al., 2017a). Others have reported the importance of pairing social interaction with eating assistance for residents living with dementia to improve nutritional intake, weight, eating independence and quality of life (Abdelhamid et al., 2016; Liu et al., 2015; Liu, Jao & Williams, 2019). Most research has focused on resident and care staff interactions; one study explored the effect of family member support on quality of mealtime assistance and food intake (Durkin et al., 2014). The current study builds on these findings (Durkin et al., 2014) by assessing actual (i.e., weighed) vs. estimated food intake, comparing nutritional quality, and accounting for key covariates such as time of meal service in the presence and absence of family member support.

5.4 Background

It has been well established that mealtimes are one of the most important aspects of a resident's day in LTC, particularly for those residents living with dementia (Campo & Chaudhury, 2012; Slaughter et al., 2011; Milte et al., 2017). Still, research that examines meals in LTC settings describe them as hectic and task-focused (Hung & Chaudhury, 2011; Lowndes et al., 2015), which is often the result of the interaction between home policies (Banerjee & Armstrong, 2015), understaffing (Daly et al., 2015; Kayser-Jones & Schell, 1997), resident complex care needs (Chiang & Hwu, 2019), unsupportive physical dining environments (Chaudhury et al., 2013) and other external pressures that can make the provision of eating-assistance from care staff a hurried and impersonal affair (Keller et al., 2017a). Specifically, requirements to support residents

with eating challenges often exceed what a home is capable of delivering due to limited staffing (Schnelle et al., 2004; Shultz, Crogan & Evans, 2006; Simmons et al., 2001), resulting in suboptimal eating assistance placing the resident at increased risk for undernutrition (Kayser-Jones & Schell, 1997; Keller et al., 2017a).

5.4.1 Mealtimes and Eating Challenges

The primary driver of malnutrition among those living in LTC is poor food intake (Keller et al., 2017a; Bauer et al., 2017; Bell et al., 2013). The loss of ability to eat independently has been identified as a potential risk factor for malnutrition among LTC residents (Bauer et al., 2017; Fávaro-Moreira et al., 2016). Upwards of 70% of residents living with dementia will experience challenges associated with neurological and visuomotor changes that will make self-feeding difficult, resulting in the necessity for outside support (Abdelhamid et al., 2016; Namasivayam-MacDonald et al., 2018; Slaughter et al., 2011; Tippett & Sergio, 2006). Other common eating challenges take the form of dysphagia where residents experience difficulty and/or discomfort while swallowing (Namasivayam-MacDonald et al., 2017). Findings from a large multi-site study conducted in LTC homes in Europe and North America reported dysphagia rates at 13% (Streicher et al., 2018). Similarly, Peladic and colleagues (2019) found that up to 16% of their resident sample were dysphagic. In Canada, Keller et al. (2017a) found dysphagia risk (signs and symptoms of potential swallowing problems) among 60% of residents. In addition, verbal communication may become increasingly impaired which may make it challenging for care staff to adequately address resident emotional needs and/or personal mealtime preferences, resulting in situations where residents may be underfed, overfed, or unable to convey discomfort or pain while eating; these discomforts are sometimes communicated through responsive or expressive behaviours (Milte et al., 2017; Stubbs et al., 2016; Whear et al., 2014). Psychosocial and physiological implications related to dysphagia and difficulties with self-feeding can have negative impacts on residents' well-being and self-esteem, particularly in group dining settings (Ballard et al., 2001; Ekberg et al., 2002; Palese et al., 2019a). For these reasons, it is essential that supportive and individualized eating mealtime assistance is provided for those who face these specific challenges.

5.4.2 Family Member's Role in Long-Term Care Settings

For many, family involvement in care does not stop once the older relative has transitioned into LTC (Barken & Lowndes., 2018; Baumbusch & Phinney, 2014; Davies & Nolan, 2004; Kodate & Timonen, 2017; Robinson et al., 2010). In Canada, over three quarters of a million informal care partners support someone living in LTC or admitted to hospital (Turcotte & Sawaya, 2015). Almost a quarter of these families provide over 10 hours of weekly care in LTC homes, with hours increasing if a resident is living with severe health conditions or dementia (Levine et al., 2010; Turcotte & Sawaya, 2015). Family involvement during mealtimes in LTC homes are typically neither the main focus in research literature, nor the focus for family-based interventions and evidence suggests that family involvement during mealtimes is limited. Instead, family involvement at meals is frequently described as peripheral occurrences that serve as examples of ways some families stay connected with their relatives.

Yet, at the same time, this same evidence provides strong indication that family members make important contributions to residents' mealtime experiences. According to one Australian study, the presence of families "dramatically changes the atmosphere of the facility", where residents' faces "lit up" with excitement (Petersen et al., 2016). Durkin and colleagues (2014) found that family members dedicated more than double the time to assist a resident as compared to meals when staff were assisting the same resident. However, this study did not find improvements in the quality of assistance or estimates of food intake when family members were present (Durkin et al., 2014). The current study seeks to expand these findings by using more precise (i.e., weighed) measurements of food intake and accounting for important factors including nutritional quality and time of day of meal service.

5.5 The Study

5.5.1 Aims

The aim of this study was to explore potential impact of family member presence at mealtimes on food intake for residents requiring eating assistance. The two research questions were:

1. What are the characteristics of residents who receive mealtime assistance from a family member compared with those who only receive mealtime assistance from care staff?

2. Is protein and energy intake significantly associated with a family member providing eating assistance to residents in long-term care homes as compared with staff providing this assistance, when adjusting for other covariates?

5.5.2 Design

We conducted a secondary data analysis of the Making the Most of Mealtimes (M3) multi-site cross-sectional study that examined multi-level factors associated with food and fluid intake among residents living in 32 Canadian LTC homes. Details on the research questions and data collection procedures of the M3 study can be found in the study protocol (Keller et al., 2017b). The current study is a cross-sectional study focused on the association between family member eating assistance at mealtimes and residents' food intake.

5.5.3 Participants

LTC homes were purposively recruited across four Canadian provinces (Alberta, Manitoba, Ontario and New Brunswick) (Keller et al., 2017b). Eight LTC homes were selected in each province to achieve diversity in terms of home size, profit-status (for profit = 10; not for profit = 22), model of care, ethno-cultural factors, rural/urban location and other home-level characteristics that could affect resident food intake (Keller et al., 2017b). Eligibility criteria for homes were: 1) operating for a minimum of 6 months and 2) having a minimum of 50 residents who met the resident inclusion criteria. In each

LTC home, residents were recruited from one to four randomly selected home areas; to ensure the participation of persons living with dementia in the sample, one of the selected home areas was a dementia-specific unit, if present in the home.

Residents were eligible to participate regardless of cognitive status. Inclusion criteria were: 1) 65+ years; 2) required a minimum of 120 minutes of care per day related to activities of daily living (e.g., bathing); 3) resided in the home for a minimum of 30 days; and 4) able to provide informed consent and/or had a substitute decision-maker provide consent. Residents were excluded from participation if they were: 1) medically unstable; 2) a temporary resident in the home (i.e., convalescent or respite care); 3) required tube feeding; 4) at the end of life; 5) ate in areas other than the dining room; or 6) had advanced directives that excluded their participation in research. Trained LTC staff determined the eligibility of each resident on participating units and used a random number table to determine the order where to approach residents to determine their interest in the study. On expression of interest, M3 researchers recruited 20 residents per LTC home. Power calculations determined that 20 residents would allow for energy intake estimation with a 95% confidence interval of ±56-58 kcal/day (Keller et al., 2017b). Of the 639 residents who participated in the M3 study, 147 were eligible (i.e., required eating assistance) and were included in this current study.

5.5.4 Data Collection

Data were collected between October 2014 and January 2016. Multi-level (i.e., resident, dining room, home) data were collected to reflect the M3 concept that resident food intake is determined by a combination of factors (Keller et al., 2014). Data at the resident level were collected using a variety of techniques, as described below. Only those residents who required physical eating assistance and also had at least six mealtime observations were included in this study.

Weighed/Observed Food Intake

The main outcome of interest for the current study is *food intake*, which was collected at all meals (i.e., breakfast, lunch, dinner) over three non-consecutive days, including one weekend day, for a total of up to nine meal observations per participant (Keller et al., 2017b). A trained research assistant weighed individual food items of main course plates before and after consumption to determine amount consumed. Side dishes (e.g., salad, dessert, soup) and fluids (e.g., juice, coffee) were estimated based on standard portions in the LTC home's production menu and predetermined volumes of serving dishes and cups (Keller et al., 2017b). Wastage or spillage of food was observed and visually estimated by the research assistants during the mealtime and subtracted from the amount served (Keller et al., 2017b). A nutrient analysis of consumed food was performed with ESHA Food Processor software (Version 10.4.1). Recipes were entered into Food Processor according to each home's food production menu. Energy (kcal/day) and protein (g/day) intake at each meal were the outcome variables.

Average intake was also calculated for descriptive purposes in this analysis. Daily intake included food consumed at three meals, as well as between meals (i.e., snacks), which were either directly observed by research staff and amounts estimated or involved research staff asking LTC staff, family members, or residents about their snack consumption. Average daily intake of energy and protein was adjusted for intra-individual variation across the three days of observation (Institute of Medicine, 2000; Keller et al., 2017b; National Research Council, 1986).

Mealtime Observations

At the same meals where food was weighed, a research assistant conducted mealtime observations on each participant. At each meal, information on *mealtime assistance* was recorded, including whether or not the participant received eating assistance from persons other than LTC staff. This includes assistance from family members, non-biological relations and/or volunteers. The nature of the relationship between the informal carer and the resident was not differentiated during mealtime observations so

that all non-staff assistance was captured in one category, referred to inclusively as "family member". For those individuals where family were not present at any meals, it was assumed that all assistance was provided by care staff. Presence (vs. absence) of family member eating assistance was the main independent variable of interest in the current analysis.

More detailed observations were made at three of the meals for each resident. Eating challenges were determined using the standardized Edinburgh Feeding Evaluation in Dementia Questionnaire (ED-FED-Q) (Watson & Deary, 1997). A single item, "Does the resident require physical help with eating/feeding?", determined the level of physical eating assistance required, scored as 'Never (1)', 'Sometimes (2)', or 'Often (3)') (Watson & Deary, 1997).

Nutritional Status

Resident nutritional status was determined using the valid Patient Generated-Subjective Global Assessment (PG-SGA) (Bauer et al., 2002; Ottery, 2000). PG-SGA, a brief and comprehensive standardized method to diagnose malnutrition, was collected for all participants by the four provincial coordinators (Keller et al., 2017b). Data were collected from the resident (e.g., physical exam), by observation (e.g., functional ability), from the health record (e.g., weight change) or based on discussion with resident, family or care partners (e.g., eating challenges experienced). The PG-SGA categorizes individuals as: 'Well-nourished (A)', 'mild/Moderate malnutrition (B)' and 'Severe malnutrition (C)' (Ottery, 2000). For the purposes of the current analysis, categories were dichotomized to compare well-nourished individuals (A) to those with mild to severe malnutrition (B and C).

Resident nutrition risk was also determined using the Mini-Nutritional Assessment-Short Form (MNA-SF; Kaiser et al., 2009), using data from LTC home staff, families and

residents' health records. The MNA-SF scores ranged from 0-14 where a higher score indicates better nutritional status.

Resident Characteristics

Resident characteristics were obtained from a variety of sources. Variables collected from a health record review included: age, sex, weight, body mass index (BMI) (calculated using weight and measured ulna length), total number of diagnoses, total number of medications and modified texture diet prescription (MTD), which was translated into categories according to the International Dysphagia Diet Standardization Initiative (IDDSI) framework (i.e., 'soft', 'bite-sized', 'minced/moist', 'pureed', 'liquidized') (Cichero et al., 2017; Vucea et al., 2019). Study project coordinators interviewed LTC staff to complete an assessment of the InterRAI-Long-Term Care Form (LTCF) (Hirdes et al., 2008) for each participant and calculated the resident's cognitive performance scale (CPS) score (Morris et al., 1994), depression rating scale (DRS) (Koehler et al., 2005), activities of daily living long-form (ADL-LF) score (Morris et al., 1999) and the aggressive behaviour scale (ABS) score (Perlman & Hirdes, 2008). A composite measure developed by the M3 research team was used to identify participant dysphagia risk: a) prescribed thickened fluids, or b) failed water and applesauce swallowing challenge, or c) observed coughing or choking during meal observations (Keller et al., 2017b).

Dining Room Audits

The *Mealtime Scan* (MTS) was used to gather dining-room level information (i.e., person-centered care, social and physical environment; dining room description during a meal) and was completed by the provincial research coordinators 4 to 6 times in each dining room (Keller et al., 2017c). All meals (breakfast, lunch, dinner) were observed at least once. Variables used in this analysis included: average duration (minutes) of meals; and average number of residents and care staff in the dining room. The average resident-to-staff ratio was calculated.

The *Dining Environment Assessment Protocol* (DEAP) was also used to gather information about the dining room (Carrier et al., 2016; Iuglio et al., 2018a) and differed from the MTS in that it focused on the qualities of the empty dining space and was collected once. The DEAP noted whether the dining room was on a specialized dementia home area or a general home area.

Home Questionnaire

The *Home-Level Questionnaire,* completed by the directors of care and food services managers, provided organizational information on meal preparation, service and staffing. The main meal served by the home was determined by a single question, 'When is your biggest meal provided?' and had two options: 'lunch/dinner' or 'supper/dinner'. Typically, the biggest meal was defined by the largest offering of the day with two hot entrée options.

5.6 Ethical Considerations

Study participants, or substitute decision-makers, provided written informed consent to participate. This protocol received clearance from ethics boards associated with all study investigators' affiliated universities. Some individual LTC homes required additional ethics review by their local/regional committees.

5.7 Data Analysis

Data were limited to those participants who required eating assistance (N=147). The first research question was answered by comparing the demographic and health characteristics for those residents who had a family member assisting at one or more observed meals (N=56), as compared with those residents who were only assisted by LTC staff at observed meals (N=91). T-tests were performed for continuous variables and chi-square analyses for categorical variables.

The second research question was answered by limiting the analysis to only those residents who had family members assisting at one or more observed meals (N=56). The aim of this analysis was to determine if energy and protein intake at the meal were associated with family providing this assistance as compared with when only staff were assisting these same residents at a meal. Linear mixed models with repeated measures were analyzed to answer this question, where individual residents were the subjects and meals were the repeated observations. Fully-adjusted linear mixed models were performed to test the main association of interest between family member presence at a given meal with intake of energy (kcal) and protein (g) at that meal as the outcomes, controlling for important covariates including age, sex, ABS score, biggest meal of the day, meal (i.e., breakfast, lunch, dinner) and home area type (i.e., general or dementia). Compound symmetry variance structure was used to account for within-subject covariance across meal observations. Since mealtime observations on any given day were assumed to be non-independent, we attempted to control for observation day as a random effect. However, the variance components were not positive definite and the model was over-adjusted so we removed this variable according to standard practice (SAS Online Manual, 2019). Data were analyzed using SAS® Studio version 3.5 (SAS Institute, Cary, NC, 2019). Statistical significance was determined at a level of $p<0.05$ for all analyses. Missing data were not imputed.

5.8 Validity, reliability and rigour

Food intake was obtained by weighed and estimated food records, which is a gold standard for evaluating individual food intake (Willett, 2012). Not all components were weighed due to time limitations; some items were estimated (e.g., side dishes, soup, beverages) based on the standard portion provided. A typical serving and serving vessels were measured before data collection to enhance the accuracy of this estimation. To conduct meal observations as completely and rigorously as possible, the research assistants were present on-site from before breakfast until after dinner, adjusting observation schedules if a participant was absent for a particular meal (Keller

et al., 2017b). Mealtimes were attended by two research assistants, who were able to corroborate observations such as the presence of a family member during the mealtime.

Where possible, valid and reliable assessments were used to collect data about the resident characteristics and mealtime environment that comprised the covariates in the current investigation. At the resident level, the ED-FED questionnaire (Watson & Deary, 1997), PG-SGA (Bauer et al., 2002), MNA-SF (Kaiser et al., 2009), the overall InterRAI-LTCF assessment (Hirdes et al., 2008) and the InterRAI-LTCF outcome scales CPS (Morris et al., 1994), DRS (Koehler et al., 2005), ADL-LF (Morris et al., 1999) and ABS (Perlman & Hirdes, 2008) are all acceptable on various psychometric properties and have been used extensively in geriatric and dementia-specific populations.

The MTS is construct valid and reliable. Construct validity was demonstrated in the M3 data set by comparison to other dining and relevant measures (Iuglio et al., 2018b) and has demonstrated excellent interrater agreement and reliability on its three main summative scales (Keller et al., 2017c). The DEAP has also demonstrated good construct validity (Iuglio et al., 2018a).

5.9 Results

5.9.1 Differences in Resident Characteristics and Assistance Provider

Of the 639 residents included in the M3 study sample (Keller et al., 2017a), 147 (23.0%) who met inclusion criteria (i.e., required eating assistance) were included in this analysis. Of those residents who required physical eating assistance, 56 (38%) residents had a family member present to assist during at least one of the observed meals. The mean age of this group was 85.2 (standard deviation [SD] 8.3) years, 34% were male and the average BMI was 23.1 (5.2) kg/m^2. Most resident characteristics, including extent of eating assistance required, were not significantly different between those who received family assistance and those who did not. Table 5.1 provides a full

comparison of residents who had a family member present for at least one meal to those who did not.

Table 5.1. Comparison of characteristics between individuals who received assistance from a family/volunteer at least once during the observation period to those who did not receive family/volunteer assistance, of all residents who required any physical assistance with eating (n=147)

Resident Characteristics	Family /Volunteer Assistance	No Family/Volunteer Assistance
Number of residents (n)	38.0% (56)	62.0% (91)
Age, years, mean (SD)	85.2 (8.3)	87.0 (8.8)
Sex, male, % (n)	33.9% (19)	22.0% (20)
Body Mass Index, kg/m^2, mean (SD)	23.1 (5.2)	22.6 (5.1)
Cognitive Performance Scale, mean (SD)	4.7 (1.2)	4.5 (1.7)
Depressive disorder present, % (n)	25.0% (14)	29.7% (27)
Activities of Daily Living-Long Form, mean (SD)	23.1 (4.8)	22.9 (5.1)
ED-FED-Q		
'Sometimes', % (n)	48.2% (27)	30.6% (45)
'Often', % (n)	51.8% (29)	31.3% (46)
Aggressive Behaviour Scale, mean (SD)	2.9 (4.0)	2.3 (3.1)
Number of medications, mean (SD)	6.6 (2.9)	6.1 (3.2)
Number of diagnoses, mean (SD)	5.0 (1.8)	5.0 (2.2)
Dysphagia risk, % (n)	83.9% (47)	**59.3% (54)***
Modified texture diets, % (n)	82.1% (46)	70.3% (64)
Malnutrition (PG-SGA), % (n)	69.1% (38)	69.2% (63)
Mini Nutrition Assessment-Short Form, mean (SD)	8.6 (2.8)	8.9 (2.6)
Dementia Home Area, % (n)	53.6% (30)	**29.7% (27)***
Average duration of meal, minutes, mean (SD)	42.7 (15.2)	39.2 (15.4)
Average ratio of residents to care staff, mean (SD)	5.6 (2.0)	6.1 (3.3)
Average daily energy intake, kcal/day, mean (SD)	1537 (329.9)	1432 (311.6)
Average daily protein intake, g/day, mean (SD)	57.6 (16.1)	52.8 (13.4)

Note: Cognitive Performance Scale scoring range is 0 = Intact, 1 = Borderline Intact, 2 = Mild Impairment, 3 = Moderate Impairment, 4 = Moderately Severe Impairment, 5 = Severe Impairment, and 6 = Very Severe Impairment. Depressive Disorder determined using Depression Rating Scale, scoring range 0–14, where scores greater than 3 indicate minor/major depressive disorders. Activities of Daily Living-Long Form based on four items (personal hygiene, toilet use, locomotion, and eating) scored 0-6, where 1 = Supervision and 6 = Total Dependence (total score out of 26). ED-FED-Q = Edinburgh Feeding Evaluation in Dementia Questionnaire, ED-FED-Q item "Does the resident require physical help with eating/feeding?" scored as 'Never', 'Sometimes', 'Often'; Aggressive Behaviour Scale score range 0–12: 0 = none, 1–2 = moderate, 3–5 = severe, and 6–12 = very severe. Modified Texture Diets includes 'minced/moist', 'pureed', 'liquidized', 'soft', and 'bite-sized'. PG-SGA, Patient-Generated Subjective Global Assessment, malnourished categories 'B' and 'C'. *SD* = Standard Deviation. Comparisons were made using Student's *t*-tests for continuous variables and chi-square tests for categorical variables; significantly different at *p < .01.

Based on chi-square tests, family assistance at meals was associated with risk for dysphagia (83.9% vs. 59.3%; X^2=12.3; df=1; p<0.01) and residents were more likely to live in a specialized dementia home area (53.5% vs. 29.7%; X^2=8.3; df=1; p<0.01) than those who were only assisted by staff. Residents who had family present also had higher daily average energy (1537 [330] vs. 1431 [311] kcal/day; t= -1.94 p=0.054) and protein intake (58 [16] vs. 53 [13] g/day t= -1.91 p=0.058); although this difference did not reach statistical significance.

5.9.2 Family Assistance Associated with Food Intake

Of the 56 participants who received family assistance, two were missing data on the biggest meal of the day and excluded from the linear mixed model analysis. Of 486 potential meal observations from the remaining 54 participants, 27 meal observations were missing data on presence of a family member. As such, 459 (94.4%) meals across the 54 participants were included in this analysis.

Family members were present for 136 (29.6%) of these meal observations. Most family assistance occurred during lunch (49.3%), with 38.2% during dinner and 12.5% during breakfast. When adjusting for relevant covariates including age, sex, ABS score and dementia home area (Keller et al., 2017a; Trinca et al., 2019), family member eating assistance was associated with significantly higher consumption of both protein (g/day; β=2.7; 95% confidence interval [CI]= 0.7, 4.6) and energy (kcal/day; β=50.4; 95% CI= 6.5, 94.1) (Table 5.2). Some of the covariates were also significantly associated with energy and protein intake (Table 5.2). Residents who were older and had higher ABS scores tended to consume significantly less protein but not energy. Protein intake was higher during dinner as compared with breakfast. Residents living in LTC homes where lunch was considered the largest meal of the day had significantly lower protein intake. Residents living in specialized dementia home areas had higher protein and energy intake.

Table 5.2. Results of the linear mixed model analyses with repeated measures testing the association between family member mealtime assistance with protein and energy intake, controlling for other mealtime factors

Variable	Protein (g) β (95% CI)	Energy (kcal) β (95% CI)
n = 459 meals		
Family Member Assistance (vs. no family member assistance at that meal)	2.7** (0.7, 4.6)	50.4* (6.5, 94.1)
Age	-0.2* (-0.4, -0.02)	-3.7 (-7.8, 0.3)
Sex, Male (vs. Female)	2.1 (-1.4, 5.6)	65.4 (-9.4, 140.2)
Aggressive Behaviour Scale	-0.5 *(-0.9, 5.7)	-7.8 (-16.4, 0.8)
Lunch (vs. breakfast)	1.6 (-0.3, 3.6)	-9.3 (-53.2, 34.6)
Dinner (vs. breakfast)	4.0*** (2.1, 5.8)	14.1 (-29.1, 57.3)
Lunch Biggest Meal	-5.7*** (-9.0, -2.5)	-47.5 (-116.1, 21.1)
Dementia Home Area	5.7*** (2.7, 8.7)	106.2*** (42.6, 169.7)

Family Member/Volunteer Assistance as compared to no family member/volunteer assistance at a meal; analysis based on 54 residents with complete data for covariates; Sex, Male as compared to Sex, Female; Lunch intake as compared to breakfast intake; Dinner intake as compared to breakfast intake. β = Parameter Estimate; CI = Confidence Interval. A total of 45 meals observations are missing as not every resident had all 9 meal observations as individual observations were excluded if they did not have complete data for all variables. Statistically significant at *p<0.05; ** p<0.01; ***p<0.001.

5.10 Discussion

When family members provide eating assistance to residents, they consumed significantly more energy (50 kcal/day) and protein (2.7 g/day) than when these same residents were only assisted by care staff. Although small, this is still clinically meaningful as a 50-calorie difference per day would result in approximately 5 pounds of body weight over the course of a year. Weighed records potentially explain the difference in findings compared to the non-significant association found previously when visual estimates of food intake were used (Durkin et al., 2014).

Until now, eating assistance in LTC in the academic literature has almost exclusively been based on observed interactions between care staff and residents, despite strong evidence of continued family involvement in resident mealtime care (Barken & Lowndes, 2018; Bramble, Moyle, McAllister, 2009; Petersen et al., 2014). Observational studies have provided strong indication that family presence during meals results in more pleasant dining experiences for residents and provides additional support for care staff

(Durkin et al., 2014). A lifetime of sharing food and eating together may play an important part in explaining our results (Genoe et al., 2012; Wong, Keller, Schindel Martin & Sutherland, 2015). Thus, it is the authors' contention that familial bonds result in more meaningful social interaction through comforting and personalized verbal and non-verbal cues that stimulate resident food intake. For those residents who may face greater challenges during meals as a result of cognitive and/or physiological changes, dedicated, focused attention from family may be extremely beneficial. Further work should explore this contention to determine if it is the primary mechanism for improved food intake observed in this study.

Our results indicate that residents with dysphagia were more likely to receive eating assistance from family members. Similar findings were reported in Puurveen and colleagues' (2018) critical interpretive synthesis: family involvement is fluid over time and most often intensifies in response to a resident's deteriorating health. The importance of additional and dedicated mealtime support for those who struggle at mealtimes - which is not always possible for busy care staff - has been shown to be extremely relevant to food intake (Liu et al., 2019; Steele et al., 2007; Remsburg, 2004). For those with dysphagia, careful hand feeding is often needed, which can require additional time. As part of encouraging family to be involved in this vital activity, families can be provided education and training on how to identify potential signs of dysphagia and aspiration risk. Further, families and some dedicated volunteers hold important historical knowledge about residents and may be able to provide essential individualized care that is needed to ensure residents are able to manage adequate nutritional intake (Cohen et al, 2014; Tornatore & Grant, 2002; Gaugler, Pot, Zarit, 2007; Yamamoto-Mitani, Aneshensel & Levy-Storms, 2002).

Residents living in a specialized dementia home area were more likely to have family members provide eating assistance and were more likely to consume more energy (±106.2 kcal/day) and protein (±5.7 g/day) per meal. In their retrospective study, Palese and colleagues (2019b) reported that increased levels of dependence in feeding was

associated with larger LTC home areas. Dementia home areas are typically home to fewer residents compared with general home area, with care staff specially trained in dementia care approaches which may better support those residents who face eating challenges and thus can address issues surrounding nutritional intake (Abbott et al., 2015). As well, care philosophies and home-like environments in specialized dementia care settings may also encourage more meaningful family involvement (Robinson et al., 2010). Often family members are informal care partners to their relative living with dementia prior to transitioning into LTC, which may play a part in their continued level of involvement after their relative has moved into a care home (Graneheim et al., 2014). Eating together is a familiar ritual among most families prior to moving into LTC, thus mealtimes may be able to provide a medium through which families of all structures and diverse ethnocultural backgrounds can exercise their cultural traditions and norms with their relatives, both as a way of providing dedicated, individualized care to the resident and to reinforce familial bonds (Henkusens et al., 2014; Petersen et al., 2016; Xiao et al., 2017).

Still, the prevalence of family involvement during mealtimes was relatively low at less than 30% of meals observed. While the authors do not condone the unpaid labour of informal caregiving to supplement underfunded LTC systems, there is a need for governments and homes to promote policies and programs that support the critical value that families play in ensuring their relatives' well-being in formal care settings (Gaugler et al., 2005; Torres, 2015). Until then, it is the responsibility of LTC homes to ensure that staff are educated and informed of the benefits of those families who continue to be active participants in their relative's well-being and care and are supported in doing so - especially at mealtimes (Durkin et al., 2014; Petriwskyj et al., 2013; Reid & Chappell, 2017).

5.10.1 Limitations

The M3 study was a large, diverse and comprehensive analysis of food intake and mealtime environments in LTC homes across Canada, however, there are limitations to

this work. The cross-sectional design of this study prevents drawing conclusions with respect to causality between resident characteristics, family member assistance and food intake. The presence of family member versus volunteer meal assistance was not differentiated during data collection, therefore we cannot be certain as to whether some meals were supported by family or by a volunteer. The three days of food intake collected likely does not fully represent the usual intake of all residents. Further, weighing post food consumption of modified texture diets where food products are often mixed together on the plate would have an impact on assessors' ability to differentiate between types of food consumed in some cases. Results from this exploratory study may not be generalizable to global LTC populations given the convenience sampling used for LTC homes.

5.11 Conclusion

This study demonstrates the importance of the relationship between the person providing eating assistance and the LTC residents receiving assistance. Specifically, family member mealtime improved food intake, especially for those residents living with dementia who may particularly benefit from long-established relationships with relatives and dedicated one-on-one eating support. In turn, encouraging the involvement of families may help to alleviate mealtime pressures felt by care staff. Additional research is needed to understand the physiological and psychological impact of family members' presence during meals as well as the processes around how families navigate their involvement at mealtimes in LTC settings.

Chapter 6: Part 3: Manuscript 3: Exploring associations between resident sensory and communication challenges, staff and family dining interactions, and resident malnutrition in long-term care: A secondary data analysis of the M3 Study

Manuscript submitted for publication
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6.1 Overview

Dining rooms can be overwhelming for residents with cognitive changes and/or communication challenges. Staff and family support at meals may help or compound these challenges. This study aims to determine how resident abilities (vision, hearing, verbal communication, wayfaring, i.e., wandering) and staff and family support at mealtime are associated with resident malnutrition. Data from the Making the Most of Mealtimes Study from residents in 32 LTC homes in four Canadian provinces were analyzed. Variables included resident nutrition status, family food involvement, other resident characteristics, and observed mealtime care actions by staff. The sample included 638 residents (mean age = 86.8 ± 7.8 years; 31.1% male), 44% of whom were malnourished. Almost 20% experienced significant vision and hearing loss and over a quarter experienced verbal communication challenges. Wayfaring at meals was observed among almost 4% of residents. Vision loss (OR=2.20, 95% CI=1.33, 3.64), verbal communication impairment (OR=1.69, 95% CI=1.08, 2.64), wayfaring (OR=3.51, 95% CI=1.43, 8.66), family mealtime presence (OR=1.65, 95% CI=1.06, 2.59), and fewer staff relationship-centred practices (OR=0.81, 95% CI=0.67, 0.98) were associated with higher likelihood of malnutrition. Consideration should be given as to how staff and families can support wayfaring residents and those with communication impairments through social and physical dining room modifications to reduce their risk of malnutrition.

6.2 Introduction

Nutritional anthropologists have long advocated for the need to devote greater attention towards the social aspects of food and eating, as the act of eating and sharing food are representations of gender, identity, culture, and relationships amongst and between individuals and communities (Counihan & Van Esterik, 1997; Douglas, 1975; Barthes, 1961). Lifelong behaviours attached to food and eating can become disrupted when older adults transition from their home into formal care settings, such as long-term care (LTC) homes (Henkusens et al., 2014). Dining rooms are one of the main communal spaces within LTC homes where residents spend the majority of their time (Abbott et al., 2013; Campo & Chaudhury, 2012; Doyle et al., 2012). For residents living with dementia, mealtimes offer one of the few opportunities to reinforce social connections with other residents (de Medeiros et al., 2012), staff (Faraday et al., 2021; Hung & Chaudhury, 2011; Watkins et al., 2017), and family members (Henkusens et al., 2014). Moreover, meal-related activities such as exercising food choices, assisting with place settings, planning special food-centred events, and supporting independent self-feeding are important ways to enact resident autonomy, identity, and sense of control (Beck et al., 2020; Driessen & Ibáñez Martín, 2020; Faraday et al., 2021; Harmer & Orrell, 2008; Liu et al., 2015; Slaughter et al., 2011).

Communication plays an important role in mealtime interactions. About one-third of residents experience combined vision and hearing impairment (i.e., dual sensory impairment), although this number is likely underestimated as sensory impairments among residents living with dementia are often undiagnosed, underreported, or undocumented (Höbler et al., 2018; Hopper et al., 2016; McCreedy et al, 2018). Hearing and vision loss among older adults are associated with increased social isolation (Lawrence et al., 2009; Mick et al., 2018; Punch & Horstmanshof, 2019) social and emotional loneliness (Weinstein et al., 2016), depression (Rutherford et al., 2018), and anxiety (Contrera et al., 2017). Dining rooms can be noisy, overstimulating environments that can make communication challenging for residents with sensory and cognitive impairments. Being selective with which social interaction to participate in is often cited as a coping strategy for residents to manage sensory impairments and social

interactions. For example, residents may withdraw from dining rooms if they find the background noise excessive to the point that there is a communication breakdown and socializing with others becomes too overwhelming (Cook et al., 2006; Dev et al., 2014; McCreedy et al., 2018; Pryce& Gooberman-Hill, 2012).

For residents living with dementia, sensory impairments can exacerbate cognitive-communication disabilities; those with hearing loss have reduced cognitive reserve and capacity to separate speech from excess dining room noise, thus decreasing motivation to invest in socializing with others (Gurgel et al., 2014; Lin et al., 2011; McCreedy et al., 2018; Pichora-Fuller et al., 2016; Pryce & Gooberman-Hill, 2012; Rutherford et al., 2018). Additional issues can arise when residents feel the motivation to walk and move during mealtimes, leaving their food and drink unfinished. Referred to in this study as "wayfaring" (sometimes referred to as "wandering" behaviour) (Graham, 2017), individual motivators and/or unmet needs during mealtimes can result in fewer opportunities to socially engage with others (Anderson et al., 2016; El Haj et al., 2017; Evardsson et al., 2008; Halek & Bartholomeyczik, 2012; Graham, 2017).

Staff play an important role in creating supportive mealtimes through care practices that honour both individual needs and reinforce the interconnectedness of those who work and live within the home. Social care models, like relationship-centred care (RCC), place emphasis on situating the resident within their complex social network by recognizing the reciprocal nature of caring relationships – residents receive care and also give back to their communities (McCormack, 2001; Nolan et al., 2004; Tresolini et al., 1994). Mealtimes within formal care settings are opportune times to apply the RCC practices as food and eating with others is a key aspect of resident quality of life (Abdelhamid et al., 2016; Jaye et al., 2016). However, a precondition to enacting RCC mealtime practices is effective communication. For residents living with dementia, socializing with tablemates and expressing mealtime needs and preferences may be challenging due to a decline in their verbal communication abilities, particularly in later stages of the disease (Machiels et al., 2017). Specifically, challenges around following directions, recalling information, understanding explanations, correctly interpreting non-

verbal communication, and articulating needs, feelings and preferences (Ben-David et al., 2016; Blair et al., 2007) can result in depression (Gruber-Baldini et al., 2005), feelings of isolation (Clare et al., 2008), and/or expressive behaviours (sometimes referred to as "aggressive" behaviours) (Dupuis et al., 2012). When opportunities for residents living with dementia to socially connect with others at mealtimes are met with care staff who lack the knowledge and skills needed to communicate effectively (Hung & Chaudhury, 2011; Kong et al., 2021; Wang et al., 2013), and/or where relationship-centred communication is a lower priority due to staff workload and time constraints (Lee et al., 2020; Lowndes et al., 2018), task-focused mealtimes often ensue.

Task-focused (TF) mealtime practices can be categorized as short interactions focused on completing mealtime processes. These practices can undermine the relationship between residents and staff (Savundranayagam, 2013) and provide limited meaningful social engagement (Moore et al., 1999) by providing few opportunities for residents to exercise their autonomy and engage in mealtime activities can elicit feelings of disrespect, invalidation, and distress (Hung & Chaudhury, 2011; Sherwin & Winsby, 2010). Providing supportive mealtime environments for residents living with dementia is particularly important, as they often face eating and other mealtime challenges associated with malnutrition, such as dysphagia (difficulty/discomfort while swallowing) (Namasivayam-MacDonald et al., 2018), poor oral health (Chalmers & Pearson, 2005; Yoon et al., 2018), and are often prescribed modified texture diets (Vucea et al., 2019). Many residents living with dementia will eventually require dedicated verbal and physical eating assistance as their dementia progresses (Liu et al., 2015; Watson & Green, 2006). Challenges with communication likely result in more TF practices when providing assistance. The ability of care staff to respond to complex mealtime care needs while facilitating a relationship-centred dining experience can be particularly difficult in LTC homes with unsupportive work environments (Kong et al., 2021; Wu et al., 2021), such as homes with low staffing levels (Banerjee & Armstrong, 2015; Huang & Bowblis, 2018). In these cases, family members and/or volunteers often respond by providing additional supports.

Families play a critical role in the lives of residents in LTC homes, including supporting mealtimes. Within Canada, it is estimated that over three quarters of a million informal care partners (i.e., biological and non-biological relations) support someone living in LTC or admitted to hospital (Turcotte & Sawaya, 2015). Twenty-five per cent of these families will provide over 10 hours of weekly care in the LTC home and will respond with increased care hours in situations where residents show a deterioration in health or live with dementia (Levine et al., 2010; Gladstone et al., 2006; Gaugler, 2005; Puurveen et al., 2018; Turcotte & Sawaya, 2015). Family involvement during mealtimes is often not the main focus of research examining informal caregiving in LTC settings, however, evidence suggests that families make important contributions to residents' mealtime experience (Baumbusch & Phinney, 2014). Families use mealtimes as opportunities to reconnect with their relatives (Petersen et al., 2014) and bring in comforting and familiar foods (Tsai et al., 2020; Xiao et al., 2017). For those residents with eating challenges, families have identified monitoring food and fluid consumption as a motivation for mealtime visitations (Tsai et al., 2020). Research has also explored the impact of family verbal and physical eating assistance where families will spend more than double the time to assist a resident as compared to staff (Durkin et al., 2014), and that resident food intake is significantly greater at meals when families provide assistance as compared to staff (Wu et al., 2020).

In addition to the social outcome of commensal eating in LTC, food intake to maintain health and nutritional status is an obvious goal of mealtimes. Inadequate nutritional intake is a longstanding issue in LTC and malnutrition or its risk occurs in 40% to 80% of residents (Donini et al., 2013; Keller et al., 2017a; Muurinen et al., 2015). Poor food intake and malnutrition are often identified among residents with mild to advanced cognitive impairment, increased functional impairment, and eating challenges (Keller et al., 2017a; Watson & Green, 2006). Sensory impairments have also been identified as risk factors for malnutrition (Wells & Dumbrell, 2006), where it is estimated that moderate hearing loss affects up to 80% of residents (McCreedy et al., 2018) and vision impairments impact anywhere from 30-57% of residents (Dev et al., 2014; Monaco et al., 2020). Wayfaring residents who tend to leave during mealtimes are at increased risk

for malnutrition, as they often leave their food and drink unfinished (Beattie et al., 2004). There is minimal research on staff and family interactions and malnutrition in LTC; it is unknown if more TF interactions are associated with malnutrition or whether family involvement in assisting is associated with residents being well-nourished. Though the relationship between sensory impairments and poor food intake is logical, there is relatively little research that examines the interplay between sensory impairments (i.e., hearing, vision), verbal communication, wayfaring, staff care provision (i.e., resident-to-staff ratio at meals; RCC or TF practices), and family food involvement (e.g., regularly bringing food into the home, providing mealtime assistance) on resident nutrition status. To the best of the authors' knowledge, this is the first observational study to address the following objectives: 1) determine resident sensory and communication characteristics, staff care provision, and types of family food involvement that are associated with resident malnutrition, and 2) determine which of these resident, staff, and family variables are independently associated with resident malnutrition, when adjusting for select covariates.

6.3 Methods

6.3.1 Data Source

This is a secondary analysis of the Making the Most of Mealtimes (M3) project, a cross-sectional study that examined resident food intake and mealtime experiences in 32 LTC homes across four Canadian provinces in Canada: Alberta, Manitoba, Ontario, and New Brunswick (Keller et al., 2017b). M3 data collection began in October 2014 and ended January 2016 and included multi-level factors from resident health care record review, mealtime observations, and standardized nutrition assessments by research staff, with family and staff consultation where required to complete key questions; staff were also interviewed to complete select components of the InterRAI-Long-term care (Keller et al., 2017b).

6.3.2 Participants

Purposive sampling was used to recruit 32 LTC homes (8 in each of the four provinces) to ensure diversity in home characteristics (e.g., size, profit-status, geographic location (urban/rural), model of care, ethno-cultural factors) known to impact food intake among residents (Keller et al., 2017b). Homes were eligible to participate in the study if they: 1) had been in operation for a minimum of 6 months; and 2) had a minimum of 50 residents who met the inclusion criteria. Residents were recruited from each home from one to four randomly selected home areas (i.e., care units). In LTC homes with a dedicated dementia-specific area, one was selected to ensure the inclusion of residents living with dementia.

Residents' eligibility included: 1) 65+ years; 2) required a minimum of 2 hours of direct care (e.g., bathing, eating, dressing) per day; 3) had resided within the home for a minimum of 30 days; and 4) were able to either provide informed consent or had a substitute decision-maker provide consent. Resident exclusion criteria included: 1) deemed medically unstable; 2) receiving convalescent or respite care; 3) required tube feeding; 4) were at end of life; 5) ate their meals in other areas than the dining room; or 6) had advanced directives that specified exclusion in research study participation. Trained LTC staff identified potential resident participants in their home areas. A random number table was then used to determine the order of approaching residents for recruitment.

Once a resident/family member indicated interest in hearing more about the research study from the project coordinator, 20 residents per LTC home were recruited to meet sufficient power for the original study aims (Keller et al., 2017b). Of the 640 residents who were initially recruited to the M3 study, one withdrew consent to participate. Thus, 639 residents were the final M3 sample; those who had complete data on all measures of interest for each analysis were included. The current study meets the requirements stipulated by Vittinghoff and McCulloch (2006) using the 'Rule of Ten Events', where 10 outcome events per predictor variable are required to adequately control for confounding in logistic regressions analyses.

6.3.3 Variables of Interest

Nutrition status

Resident nutrition status was determined using the Patient Generated-Subjective Global Assessment (PG-SGA) (dos Santos et al., 2015; Ottery, 2000), a variant of Subjective Global Assessment that was selected based on the inclusion of a greater variety of risk factors known to impact food intake, including items related to eating challenges (e.g., mouth sores, constipation, slow to eat, dry mouth), nutrition impact symptoms, and a larger range of functional impairment (dos Santos et al., 2015; Ottery, 2000). PG-SGA categorized residents as either A = "well nourished", B = "moderate/suspected malnutrition" or C = "severely malnourished", which was dichotomized into "well nourished" (A) and "malnourished" (B/C) and as the outcome variable in the current analysis. M3 project coordinators, who were trained dietitians or had completed a dietetic program, collected information from resident charts (e.g., weight change), home staff and family members (e.g., eating challenges), mealtime observations (e.g., functional ability), and residents (e.g., physical exam) to complete the PG-SGA for each resident participant (Keller et al., 2019).

Family food involvement

Mealtime observations were conducted at all meals (i.e., breakfast, lunch, and dinner) over three non-consecutive days (including one weekend day) for a total of up to nine meals observed per participant (Keller et al., 2017b). Information on mealtime assistance was recorded at each meal, including whether a family member (including non-biological relations) and/or volunteers was present at that meal. The nature of the relationship between family members and volunteers was not differentiated during data collection and is categorized as "family member" (vs. care staff) for this analysis.

Family food involvement also included whether family routinely brought in food (e.g., once per week) for residents, dichotomized as yes/no. This information was elicited from family members or residents at the time of collection of the PG-SGA, or from the health care record if this could not be determined from the resident/family.

Care staff Interactions

The *Mealtime Scan* (MTS) is a valid and reliable observational tool used to assess the quality of the mealtime experience in long-term care settings (Iuglio et al., 2018b; Keller et al., 2017b). The MTS documented both individual resident-level and dining room-level data, including the average number of residents and care staff in the dining room, which was used to calculate the average ratio of residents per staff involved in direct mealtime care in the dining room (Keller et al., 2017b). Direct mealtime care excluded the number of staff only involved in plating or passing meals to residents.

The MTS also included a subscale, the Mealtime Relational Care Checklist (M-RCC), a 26-item valid and reliable (RCC practices Intraclass Correlation Coefficient [ICC]= 0.73; TF practices ICC=0.85) tool that captures information on mealtime interactions (e.g., supporting mealtime preferences, social conversations, eating assistance) and staff care practices as the relate to PCC and RCC philosophies of care (Iuglio et al., 2019). Care staff interactions with residents were captured as either RCC practices or TF practices during mealtime observations of those residents using the M-RCC (Iuglio et al., 2019). The first 17 items of the M-RCC assess mealtime interactions appropriate for all residents, whereas the last 7 items are pertinent to only those residents who require eating assistance (n=127) and a final two items focus on mealtime cleanup processes. Only the 17 items focused on general resident interactions were used in this analysis. Items are dichotomized so that the observer scored staff interactions with residents as either a RCC practice (e.g., Are allowed to be involved in mealtime tasks, including self-feeding) and/or a TF practice (e.g., "Are discouraged from mealtime tasks, including self-feeding") during a meal. It was possible for both RCC and TF practices to be scored for some items, but not all. For example, assigned seating could only be scored at a meal as TF if received and if residents could select their own table as RCC. However, a resident could be included in some conversations with staff and blatantly excluded in these social interactions by other staff at the same meal, thus RCC and TF for this practice would be noted for that meal. RCC practices and TF practices were summed separately for each meal observation then averaged across 3 meal observations for

each resident, to give an average RCC practices score and TF practices score at the resident level (max 17 for each).

Resident Characteristics

Data on resident characteristics were collected from several sources. Health records were reviewed for resident age, sex, body mass index (BMI; determined by recorded weight and ulna length measured by researcher used to estimate standing height), total number of medications, total number of diagnoses, and modified texture diet prescription (MTD) which was translated into categories (i.e., 'soft', 'bite-sized', 'minced/moist', 'pureed', and 'liquidized') based on the International Dysphagia Diet Standardization Initiative (IDDSI) framework (Cichero et al., 2017; Vucea et al., 2019). M3 project coordinators interviewed home staff to complete an assessment based on select components from the interRAI-Long-Term Care Form (interRAI-LTCF; Hirdes et al., 2008) for each resident participant. Measures from the interRAI-LTCF included cognitive performance scale (CPS) score (Morris et al., 1994), depression rating scale (DRS) score (Koehler et al., 2005), aggressive behaviour scale (ABS) score (Perlman & Hirdes, 2008), and the activities of daily living long-form (ADL-LF) score (Morris et al., 1999) and were based on the care staff's perspective of the resident health over a three-day period prior to the assessment. Higher scores on the CPS (range: 0-6), DRS (0-14), ABS (0-12), and ADL-LF (0-28) indicate more severe impairment or risk for each of the respective scores. Resident communication and sensory data were also recorded from the interRAI-LTCF, including whether a resident was able to make themselves understood, their ability to hear (with hearing aids), and whether they were able to see in adequate lighting (with vision aids). These items were scored on a scale of 0-4, where 4 indicated greater impairment. These variables were dichotomized for this analysis as impaired "No" (0,1,2) or "Yes (3,4)".

Residents' oral health status was assessed by a trained dental hygienist using a standardized assessment, including determining the likelihood that a resident would experience challenges while eating as a result of their current oral health conditions

(e.g., loose teeth) or was in need of urgent oral care (e.g., abscess) (Keller et al., 2017b). Residents were recorded as at risk of dysphagia if they required any of the following: a) prescribed thickened fluids, or b) failed water and applesauce swallowing challenge, or c) observed coughing/choking while eating/drinking during one of nine meal observations (Keller et al., 2017b).

Data on resident eating challenges was collected during mealtime observations using the Edinburgh Feeding Evaluation in Dementia Questionnaire (Ed-FED-Q) (Watson & Deary, 1997). A single-item from the Ed-FED-Q determined the level of physical eating assistance required, "Does the resident require physical help with eating/feeding?"; scored as "Never (1)', "Sometimes (2)", or "Often (3)" (Watson & Deary, 1997). It was noted if a resident left and returned to the dining room at any meal that was observed by the research team before the food was consumed and the meal finished; this was recorded as 'wandering' (Yes/No). The authors are aware that the term "wandering" can be a problematic way of describing behaviour, particularly among residents living with dementia (Halek & Bartholomeyczik, 2012) and choose to interpret this behaviour in the context of this study as purposeful 'wayfaring' (Graham, 2017).

6.3.4 Analysis

We hypothesized that the type of staff interaction (RCC vs. TF practices) and family food involvement, as well as resident communication and sensory variables (e.g., vision impairments) would be associated with resident malnutrition. We also hypothesized that these variables were independently associated with resident malnutrition, when adjusting for selected covariates. These associations were investigated according to a pre-determined analytic plan.

Resident characteristics were described as mean (standard deviation, SD) or percent (%). Bivariate analyses (i.e., t-test, chi-square tests) were performed to compare well-nourished and malnourished residents on various characteristics (e.g., demographic, resident communication, family social interaction, and mealtime care practices).

A fully adjusted multivariable logistic regression analysis including covariates selected based on prior empirical research regarding predictors of malnutrition was used to determine which resident characteristics (e.g., MTD prescription; Vucea et al., 2019) and social interaction variables (e.g., staff mealtime care approaches; Liu et al., 2020a) were independently associated with being malnourished. In the fully adjusted model (Supplemental Table 6.1), it was found that key covariates known to be strong predictors of food intake (e.g., eating assistance, dysphagia risk) were also influential predictors of malnutrition (Namasivayam-MacDonald et al., 2017; Tamura et al., 2013), and the sensory and social interactions of interest were nominally or not significant. It was recognized that our variables of interest (e.g., communication challenges), were likely to be collinear with eating assistance, dysphagia risk and other predictors of malnutrition. Post-hoc bivariate analyses confirmed this. For example, residents' ability to make themselves understood, vision, and hearing impairments were significantly associated with requiring physical eating assistance (verbal: $p < .0001$; vision: $p < .0001$; hearing: $p=.0246$) and being prescribed modified texture diets (verbal: $p < .0001$; vision: $p < .0001$; hearing: $p=.0118$). Dysphagia risk was associated with vision impairment ($p=.0159$).

As it was our purpose to explore how secondary resident characteristics (e.g., sensory impairments, communication challenges, wayfaring) interacted with staff mealtime practices and family involvement that could influence food intake, models focused solely on age, sex, and these variables of interest were created to understand these associations. For these analyses, variables were entered in blocks with malnutrition as the outcome. In this way the variance in the outcome could be partitioned to understand the most influential group of covariates. First, a simple model adjusted for demographic variables (i.e., age, sex). A second block of resident variables was added (i.e., verbal, hearing, and vision impairments, wayfaring). Staff variables (i.e., RCC/TF practices, ratio of residents to staff involved in eating assistance) were then added to the model. To determine the association of family food involvement, staff variables were removed from the fourth model. The final full model included both staff and family variables to

determine the independent effects of resident, staff, and family variables of interest on malnutrition. Max-rescaled R^2 was examined to determine the total variance explained by each of these five models. Data were analyzed using SAS® Studio version 3.5 (SAS Institute, Cary, NC, 2019). Statistical significance was determined at a level of $p<0.05$ for all analyses. Missing data were not imputed.

6.3.5 Ethics

All study investigator's affiliated university ethics boards provided ethics approval: University of Alberta (Pro00050002), University of Manitoba (J2014:139), University Hospital Network, University of Toronto (16-5051-DE), University of Waterloo (ORE#20056), and the Université de Moncton (1415–022). In some cases, individual LTC homes were required to obtain additional ethics clearance from their local/regional ethics committees. All participants or their substitute decision-makers provided written, informed consent to be involved in the M3 study.

6.4 Results

A total of 639 resident participants included in the M3 study sample (Table 6.1) (Keller et al., 2017a). Almost one-third of residents were male (31.1%) and were an average age of 86.7 years (SD 7.8). More than half of the residents in this sample were living with moderate to advanced dementia (55.7% with CPS>3) and one third (33.3%) were at risk of or had a diagnosis of depression. Almost half of residents had oral health issues that likely impacted food intake (49.4%) and 59.2% had or were at risk of dysphagia; close to half of residents were prescribed modified texture diets (i.e., soft and bite-sized, minced or pureed) (47.1%). Eating challenges were common among residents (Ed-FED-Q total score mean 12.4±2.3 out of 30) and close to half of the resident sample (44%) was found to be malnourished.

Table 6.1. Descriptive characteristics of residents, family and staff

	Mean (SD) / Valid % (n)
Resident Characteristics	
Age, mean (SD)	86.8 (7.8)
Sex (Male), % (n)	31.1 (199)
Body Mass Index, mean (SD)	25.3 (5.7)
Moderate to Advanced Dementia (CPS 3-6), % (n)[a]	55.7 (353)
Depression Risk, % (n)	33.3 (213)
Activities of Daily Living – Long-Form, mean (SD)[a]	15.0 (7.9)
Aggressive Behaviour Scale, mean (SD)[a]	1.9 (3.1)
Wayfaring at any meal, % (n)	3.9 (25)
Total number of diagnoses, mean (SD)	5.4 (2.0)
Total number of medications, mean (SD)	7.5 (3.4)
Oral health likely to affect food intake, % (n)[a]	49.4 (280)
Dysphagia Risk, % (n)	59.2 (378)
Ed-FED-Q Total Score, mean (SD)[a]	12.4 (2.3)
Level of Eating Assistance, % (n)[a]	
"Never"	76.8 (487)
"Sometimes"	11.4 (72)
"Often"	11.8 (75)
Any modified texture diet, % (n)	47.1 (301)
Malnourished, % (n)[a]	44.0 (281)
Resident ability to make self understood, % (n)[a]	
Yes (understood, usually, often)	73.7 (468)
No (sometimes, rarely, never)	26.3 (167)
Resident ability to hear, % (n)[a]	
Yes (adequate, minimally difficult)	81.6 (518)
No (moderately difficult, severe, no hearing)	18.4 (117)
Resident ability to see, % (n)[a]	
Yes (adequate, minimally difficult)	82.5 (523)
No (moderately difficult, severe, no vision)	17.5 (111)
Family Food Involvement	
Family routinely (i.e., 1/week) brings in food, % (n)[a]	
Yes	35.5 (226)
No	64.5 (411)
Family member present during any meal, % (n)	
Yes	21.6 (138)
No	78.4 (500)
Care Staff Interactions	
Average ratio of residents per staff involved in direct mealtime care, mean[a] (SD)	7.7 (4.4)
Resident level RCC Practices, mean (SD)[a]	9.6 (1.5)
Resident level TF Practices, mean (SD)[a]	5.6 (2.1)

Data is based on a sample size of N=639. Residents with incomplete data indicated below and % based on only those providing data. a = Missing data: Cognitive Performance Scale n=5; Aggressive Behaviour Scale n=7; Activities of Daily Living n=5; Oral health n=72; Ed-FED n=5; Eating assistance n=5; Nutrition status n=1; Resident self understood n= 4; Resident hearing n=4; Resident vision n=5; Family provide food n= 2; Family presence at meal n=1; Resident to staff ratio n=70; RCC Practices n=5; TF Practices n=5.

Communication challenges where residents could 'sometimes' to 'never' make themselves understood affected over a quarter of participants (26.3%). Hearing impairments (including while wearing usual hearing devices) that resulted in moderate to no hearing impacted 18.4% of residents, and 17.5% of residents experienced moderate to no vision (including when using usual visual aids). Wayfaring during any meal was observed among 3.9% of residents. Approximately 35.5% of residents had family members bring them food at least once per week and 21.6% of residents had a family member present during any meal observation (Table 6.1). An average ratio of 7.7±4.4 staff were involved in resident direct mealtime care. Resident level RCC practices (9.6±1.5) were more common during mealtimes than TF practices (5.6±2.1). PG-SGA was completed for 638 participants; 44% were identified to be malnourished.

Table 6.2. Comparison between well-nourished and malnourished residents with resident, family and staff variables (N=638)

Social Interaction Items	Well-nourished (n=357)	Malnourished (n=281)
Age, mean (SD)	85.4 (7.9)	88.6 (7.3)***
Sex (Male), % (n)	32.8 (117)	29.2 (82)
CPS 3+ (vs. <3), % (n)[a]	44.9 (160)	69.3 (192)***
Depression Risk, % (n)	31.4 (112)	35.6 (100)
Aggressive Behaviour Scale, mean (SD)[a]	1.6 (2.7)	2.3 (3.4)***
Wayfaring at any meal, % (n)	2.5 (9)	5.7 (16)*
Activities of Daily Living – Long Form, mean (SD)[a]	12.8 (7.3)	17.7 (7.7)***
Total number of diagnoses, mean (SD)	5.4 (2.0)	5.5 (2.0)
Total number of medications, mean (SD)	7.8 (3.5)	7.2 (3.4)*
Oral health likely to affect food intake (vs. no affect), % (n)[a]	43.3 (145)	58.2 (135)***
Ed-FED-Q Total Score, mean (SD)[a]	11.7 (1.7)	13.3 (2.6)***
Level of Eating Assistance, % (n)[a]		
"Never"	87.3 (310)	63.7 (177)***
"Sometimes"	7.0 (25)	16.6 (46)***
"Often"	5.6 (20)	19.8 (55)***
Dysphagia Risk (vs not at risk), % (n)	54.3 (194)	65.5 (184)**
Any modified texture diet (vs. regular), % (n)	35.0 (125)	62.3 (175)***
Resident unable to make self understood (vs. able to make self understood), % (n)[a]	19.4 (69)	35.3 (98)***
Resident hearing challenges (vs. no challenges), % (n)[a]	12.9 (46)	25.5 (71)***
Resident vision challenges (vs. no challenges), % (n)[a]	11.2 (40)	25.6 (71)***
Family routinely brings in food (1/week) (vs. brings in food fewer than 1/week), % (n)	39.7 (141)	30.3 (85)*
Family member present during any meal (vs. no family member present), % (n)[a]	17.4 (62)	26.7 (75)**

Average ratio of residents per staff involved in direct mealtime care, mean (SD)[a]	7.8 (4.6)	7.6 (4.1)
Resident level RCC Practices, mean (SD)[a]	**9.8 (1.4)**	**9.4 (1.5)***
Resident level TF Practices, mean (SD)[a]	**5.3 (1.9)**	**6.0 (2.2)***

Statistically significant at *p<0.05; ** p<0.01; ***p<0.001.

Abbreviations: SD=Standard Deviation; Ed-FED = Edinburgh Feeding Evaluation in Dementia Questionnaire; RCC=Relationship-Centred; TF=Task-Focused.

Data is based on a sample size of N=638 with 1 PG-SGA result missing.

a = Missing data: Cognitive Performance Scale n=5; Aggressive Behaviour Scale n=7; Activities of Daily Living n=5; Oral health n=71; Ed-FED-Q n=5; Eating assistance n=5; Resident self understood n=4; Resident hearing n=4; Resident vision n=5; Family presence at meal n=1; Family provide food n= 2; Resident to staff ratio n=70; RCC Practices n=5; TF Practices n=5.

Bivariate analyses indicated that being malnourished was associated with older age, living with moderate to severe cognitive impairment, exhibiting expressive behaviours (i.e., aggressive behaviours), wayfaring during any meal, and higher ADL scores as compared to those residents who were well-nourished (Table 6.2). Poor oral health that impacted food intake, overall eating challenges (Ed-FED-Q), and physical eating assistance requirements ('sometimes', 'often') was associated with being malnourished. Residents at risk of dysphagia and those prescribed modified texture diets were more likely to be malnourished. Resident sensory and communication variables were also associated with malnutrition. Residents who struggle to make themselves understood and experienced hearing or vision challenges were more likely to be malnourished. Residents with family members who brought in food at least once per week were significantly more likely to be well-nourished than malnourished; however, those residents who had a family member present during mealtimes were significantly more likely to experience malnutrition than their well-nourished counterparts.

Table 6.3. Multivariable logistic regression testing the association between resident, staff and family variables that influence mealtime interactions and a resident being malnourished, controlling for select covariates

Social Interaction Variables	Malnourished OR (95% CI)				
	Model 1	Model 2	Model 3	Model 4	Model 5
n	638	633	559	630	558
Age	1.06 (1.03, 1.08)***	1.06 (1.04, 1.09)***	1.06 (1.04, 1.09)***	1.06 (1.04, 1.09)***	1.06 (1.04, 1.09)***
Sex, Male	0.95	1.03	0.99	1.06	1.00

	(0.67, 1.35)	(0.71, 1.48)	(0.66, 1.47)	(0.73, 1.54)	(0.66, 1.50)
Wayfaring at any meal (vs. no wayfaring)	-	**3.35 (1.39, 8.06)****	**3.70 (1.51, 9.07)****	**3.10 (1.28, 7.51)***	**3.51 (1.43, 8.66)****
Resident unable to make self understood (vs. able to make self understood)	-	**2.20 (1.48, 3.26)*****	**1.93 (1.25, 2.97)****	**1.92 (1.27, 2.89)****	**1.69 (1.08, 2.64)***
Resident hearing challenges (vs. no challenges)	-	1.43 (0.91, 2.25)	1.13 (0.69, 1.84)	1.41 (0.89, 2.22)	1.13 (0.69, 1.83)
Resident vision challenges (vs. no challenges)	-	**1.92 (1.20, 3.06)****	**2.23 (1.36, 3.68)****	**1.86 (1.16, 2.99)***	**2.20 (1.33, 3.64)****
Family routinely brings in food within last week (vs. brings in food fewer than 1/week)	-	-	-	0.73 (0.50, 1.05)	0.74 (0.50, 1.10)
Family member present during any meal (vs. no family member present)	-	-	-	**1.64 (1.08, 2.49)***	**1.65 (1.06, 2.59)***
Average ratio of residents per staff involved in direct mealtime care	-	-	1.02 (0.98, 1.07)	-	1.03 (0.98, 1.07)
Resident level RCC Practices	-	-	**0.83 (0.69, 0.99)***	-	**0.81 (0.67, 0.98)***
Resident level TF Practices	-	-	1.00 (0.88, 1.14)	-	0.97 (0.85, 1.11)
Wald χ2	24.43	59.97	61.42	66.08	66.16
Max-rescaled R-Square	0.05	0.14	0.17	0.16	0.18

Abbreviations: OR= Odds Ratio Point Estimate; CI = Confidence Interval; ED-FED = Edinburgh Feeding Evaluation in Dementia Questionnaire; RCC=Relationship-Centred; TF=Task-Focused.
Statistically significant at *p<0.05; ** p<0.01; ***p<0.001.

Table 6.3 includes the multi-model regression analyses that examined potential

associations between resident sensory and communication challenges, resident:staff

involved in eating assistance, and type of staff interactions and family food involvement and malnutrition. Wayfaring at any meal, residents' inability to make themselves understood and resident vision challenges were significantly associated with being malnourished. The only staff variable associated with being malnourished (Models 3 and 5) was RCC practices; malnourished residents were less likely to be recipients of RCC dining practices from staff. Model 4 focused on family variables and excluded staff variables to examine these alone and determine if resident associations were influenced by their inclusion. Family members presence at meals was positively associated with being malnourished and this association held in the final model when staffing variables were reintroduced. Looking across models, the odds ratio (OR) for resident inability to make 'self understood' was reduced between model 2 (OR=2.2, 95%CI=1.48, 3.26) and Model 5 when the family and staff social variables were included (OR=1.69, 95% CI=1.08, 2.64), while wayfaring and resident vision challenges had slightly higher OR in the final model as compared to when they were entered in Model 2. Family and staff variables were stable from their entry model to final model. The final fully adjusted logistic regression model explained 18% of the variance in residents being malnourished (LRT (6) = 80.51, p<.0001; n=558). Each block was statistically significant (e.g. Model 1 (LRT (2) = 26.12, p<.0001; n=638; max-rescaled R^2=0.05; Model 5 LRT (6) = 80.51, p<.0001; n=558)), however, the number of cases was reduced due to missing data. The block of variables that explained the most variance were resident sensory and communication challenges (Block 2).

6.5 Discussion

This study is the first to explore sensory and communication impairments of residents with the outcome of malnutrition, as well as family food related involvement and staff mealtime interactions and capacity for these interactions as measured by the proxy of resident to staff ratio in the dining room. Research examining the association between malnutrition and sensory and communication impairments among LTC residents is limited, largely in part due to the challenges around regular assessment and treatment of sensory impairments in this older population (Andrusjuk et al, 2020; Hobler et al.,

2018). Further, sensory and communication impairments are often 'lost in the mix' of general eating challenges, that are common in residents of LTC.

In this analysis, resident verbal communication challenges, vision impairment, and wayfaring during meals were significantly associated with being malnourished across all models with this block of resident impairments explained the most variance in the logistic regression. A recent study by Rabiee and colleagues (2021) explored the experiences of loneliness among residents with sight loss and describe the dining room as a source of anxiety for these residents. Residents with vision impairments rely more so on their hearing abilities (and being heard) for orientation and social engagement, thus excess noise in dining rooms and potential feelings of embarrassment associated with eating difficulties can be enough to deter some residents from eating and from enjoying mealtimes with others (Rabiee et al., 2021). Such accounts paint a more nuanced picture of the social and nutritional impact of unsupportive dining environments. The interplay between sensory impairment and socialization, and how these factors may impact residents' food intake and thus nutrition status is not well understood and is an area in need of further investigation using both quantitative and qualitative methodological approaches (Morrison-Koechl et al., 2021).

Although there were only 25 residents observed wayfaring during any of the mealtime observations, it was found to have a high odds ratio with being malnourished. It is challenging to understand why wayfaring happens at meals as many residents are not in a position to be able to describe their reasons for leaving the table. It can be hypothesized that it is the physical environment that may play a part in wayfaring. Poorly designed dining spaces that are noisy and crowded have the capacity to increase resident dependence for completing ADLS (e.g., eating) and elicit feelings of social withdrawal (Chaudhury et al., 2013), particularly among those with cognitive and sensory impairments (McCreedy et al., 2018; Slaughter et al., 2020; Venturato, 2010; Verbeek et al., 2010). Furthermore, dining environments are areas in LTC homes where negative resident-to-resident interactions are common, as it is a congregate space with frequent triggers (e.g., calling out, repetitive speech, screaming) (Rosen et al., 2008).

Morley and Kraenzle (1994) reported significant weight loss among residents who tended to leave their meals unfinished to "wander" during mealtimes. Post-hoc analysis in this study revealed that wayfaring during mealtimes was not significantly associated with either family presence during mealtimes or staff RCC practices, thus indicating that tendencies to walk away during mealtimes may be moderated by other mealtime contextual factors that were not measured, and potentially the physical environment. Wayfaring is a complex phenomenon that has been heavily pathologized by the biomedical community (i.e., Cipriani et al., 2014). By assigning this behaviour as disordered and/or irrational, there is a risk of neglecting to examine the impact that the social and physical dining environments may have on a resident's decision to walk away during a meal (Dupuis et al., 2012; Lee et al., 2021), and thus potentially compromise their food intake.

Our findings indicate that staff play an important part in engaging with residents living with dementia and sensory impairments in such a way as to ensure adequate nutritional intake, potentially through the way they interact with residents. Though staff provided more RCC practices than TF practices during meals overall (Table 6.1), residents who received less RCC practices from staff were more likely to be malnourished. This could be interpreted as symptomatic of high resident-to-staff ratios and chronic understaffing staffing in the LTC sector - a barrier to quality mealtime care (Berta et al., 2010; Dyck, 2007; Lowndes et al., 2018; Hung & Chaudhury, 2011; Schnelle et al., 2016), however, the ratio of residents-to-staff was not significantly associated with malnutrition in this analysis. It is critical that staff have support to provide RCC practices (Rockwell, 2012; Wu et al., 2021), which includes prioritization for RCC by home leadership and other staff, education, training, and additional one-on-one time with residents, especially for residents with sensory and cognitive impairments (Kong et al., 2021; Lawrence et al., 2009; Liu et al., 2020b; Song et al., 2020). In doing so, there is potential to improve resident food intake (Liu et al., 2020a), as positive supportive communication from staff elicits positive responses from residents (Savundranayagam et al., 2016).

Family presence during mealtimes was associated with a higher likelihood of resident malnutrition, however, outside food routinely brought in by families was not. We know from prior work that families become more involved as a residents' health declines (Keefe & Fancey, 2000; Puurveen et al., 2018), which may explain why families are involved to support mealtimes with residents who are malnourished. There is limited research focused on informal family caregiving in LTC. However, a recent phenomenological study found that motivations underlying family involvement at mealtimes in Taiwanese nursing homes were twofold: family attended mealtimes to ensure adequate nutritional intake and to create an atmosphere that provided comfort "similar to family meals when the resident lived at home" (Tsai et al., 2020, p.8). The impact of family presence during mealtimes on resident food intake is limited with mixed results: Wu and colleagues (2020) found that both protein and energy intake improved with family eating assistance when compared to staff assistance in these same residents, whereas Durkin et al. (2014) reported no difference in resident food intake with family eating assistance. However, the authors did speculate that those residents who had family assistance were consistently poor eaters and thus may not have benefited from this type of support, though food intake was determined using visual estimations and not actual weighted food intake (Durkin et al., 2014). Still, the added benefit of family mealtime involvement has shown to vastly improve social aspects of mealtimes and the quality of life for residents within the home (Barken et al., 2016; Kemp, 2021; Petersen et al., 2016).

While the associations between communication, sensory impairment, and malnutrition are seemingly sensical, there has been little investigation to confirm these associations in LTC resident populations, especially while considering family involvement and staff interactions which may reduce or exacerbate these challenges. Our study provides a clearer understanding of the interplay among these variables. Recently published findings from an international study indicate that staff in LTC homes are ill equipped to administer screening tools and support residents living with dementia in their use of assistive devices, despite being aware of their vision and hearing difficulties (Dawes et al., 2021). There is a need to foster a "social care ecosystem" that includes

interventions that go beyond the application of sensory aids to incorporate staff training using a rehabilitative approach to improve/maintain resident functionality (Leroi et al., 2021) and provide RCC practices at mealtimes to all. Specifically, staff need to be supported to assist with device maintenance (Punch et al., 2019), be trained on cognitive-sensory specific care and enabling communication strategies (e.g., promoting participation and joint decision-making, sensitivity to non-verbal cues) (Adams & Gardiner, 2005) that allow for relationship building and maintenance. Our study's findings also demonstrate the dedication and responsiveness of families when residents' food intake declines to a critical point. Families continue to provide essential unpaid care to residents in LTC homes, such as physical eating assistance, though much of their contributions to the sector have historically gone unrecognized (Eggers et al., 2020; Kemp, 2020; Tsai et al., 2020). More recently there is a growing effort by LTC homes to support family inclusion, in particular for residents living with dementia. A systematic review identified that interventions are focused on fostering relationships between family and staff, but there was little evidence that these interventions increased family inclusion, such as at mealtimes, within the home (Backhaus et al., 2020). Future research is needed to identify the multi-level factors critical to creating engagement of families within these formal care settings as they continue to provide mealtime care to malnourished residents (Puurveen et al., 2018).

6.5.1 Limitations

The M3 study dataset offered a robust and diverse sample of LTC residents across Canada, with rigorous data collected on comprehensive indicators on the mealtime experience and nutritional factors. However, there were some limitations to the study. First, the cross-sectional design of M3 prevents conclusions related to causality between resident characteristics, staff care practices, family food involvement, and malnutrition. Second, the presence of family member versus volunteer during mealtimes was not differentiated during data collection, thus we cannot be certain as to whether some resident meals were supported by a family member or by a volunteer. Third, data collection on resident vision and hearing loss was based on assessments while using

usual assistive devices; it is unclear as to whether residents were using these devices during study data collection. Fourth, some data on variables focused on in this analysis were collected based on report of family members, residents and staff; there is likely variability as a result. Fifth, the sample size for all regression analyses was reduced as only cases with complete data on selected variables were included. Finally, the sample of wayfaring residents is small and may have increased the likelihood of a Type II error skewing results. More research is needed to understand the individual and contextual reasons for why residents living with dementia leave during mealtimes and how this might contribute to malnutrition. Despite these limitations, the results highlight the importance of mealtime interactions, communication, and sensory impairments on the nutrition status of LTC residents.

6.5 Conclusion

Mealtimes in LTC homes are important to ensure adequate resident food intake and to support social connections between residents, staff, and families. This is the first study to explore resident communication, vision and hearing impairments, and mealtime staff interactions and family involvement with resident malnutrition within Canadian LTC homes. Our findings suggest that LTC residents with communication and sensory impairments are at increased risk of malnutrition. Further, study results indicate that staff provide less RCC mealtime practices to malnourished residents, and that family members respond to residents' changing needs to support malnourished residents at mealtimes. Special consideration should be given to how staff can support wayfaring residents, and those with sensory changes to reduce the risk of malnutrition. At minimum, staff should be equipped with education and training to support residents with these unique challenges through enabling communication methods (Adams & Gardiner, 2005), as well as the maintenance and updating of their vision/hearing devices (Dawes et al., 2021). Home leadership has the responsibility to foster RCC mealtime practices and for families to feel included as important members who continue to support the most nutritionally vulnerable residents.

6.6 Ethical Statement

The M3 Study obtained ethics approval through the Universities of Alberta (Pro00050002), Manitoba (J2014:139), Moncton (1415-022), and Waterloo (ORE#20056). Local ethics boards provided approval to the participating long-term care homes as required. All participants or their substitute decision makers provided written, informed consent to be involved in the M3 Study.

Supplemental Table 6.1. Multivariable logistic regression testing the association between being malnourished and resident characteristics, staff interaction variables and family food involvement (N=487)

Co-Variates	Malnourished OR (95% CI)
Resident Characteristic Variables	
Age	**1.06 (1.0, 1.1)***
Sex (Male)	1.25 (0.8, 2.0)
Cognitive Performance Scale 3+ (vs. <3)	1.28 (0.8, 2.2)
Depression Risk (vs. not at risk)	1.52 (0.9, 2.5)
Aggressive Behaviour Scale Score	0.99 (0.9, 1.1)
Activities of Daily Living – Long Form	1.04 (1.0, 1.1)
Wayfaring at any meal	**3.04 (1.0, 8.9)***
Total number of diagnoses	1.04 (0.9, 1.2)
Total number of medications	0.99 (0.9, 1.1)
Oral health likely to affect food intake (vs. no affect)	1.27 (0.8, 2.0)
Ed-FED-Q Total Score	**1.39 (1.2, 1.7)***
Level of Eating Assistance	
"Sometimes" (vs. Never)	1.06 (0.5, 2.4)
"Often" (vs. Never)	0.78 (0.3, 2.4)
Dysphagia Risk (vs. not at risk)	**1.61 (1.0, 2.5)***
Any modified texture diet (vs. regular)	**1.78 (1.1, 2.8)***
Resident unable to make self understood (vs. able to make self understood), % (n)	0.62 (0.3, 1.2)
Resident hearing challenges (vs. no challenges), % (n)	1.12 (0.6, 2.0)
Resident vision challenges (vs. no challenges), % (n)	1.37 (0.7, 2.5)
Family Food Involvement	
Family routinely brings in food within last week (vs. brings in food fewer than 1/week)	1.03 (0.7, 1.6)
Family member present during any meal (vs no family member present)	1.02 (0.6, 1.7)
Staff Interaction Variables	
Average ratio of residents per staff involved in direct mealtime care	**1.05 (1.0, 1.1)***
Resident level Relationship-Centred Care Practices	0.86 (0.7, 1.1)
Resident level Task-Focused Practices	**0.83 (0.7, 1.0)***

Abbreviations: OR= Odds Ratio Point Estimate; CI=Confidence Interval; Ed-FED-Q=Edinburgh Feeding Evaluation in Dementia Questionnaire
Statistically significant at *p<0.05; ** p<0.01; ***p<0.001.
Only cases where resident had complete data were included in this analysis; residents with incomplete data on all variables were not included in this regression.

Chapter 7: Discussion

Mealtimes that are grounded in the RCC and PCC philosophies have the ability to provide opportunities for meaningful connection between residents, staff, and families. Referring back to Douglas's deciphering of 'The Meal' as an expression of close friendship (1975), results from the current studies suggest that mealtimes in Canadian LTC homes need to improve and specifically for residents with diverse eating challenges.

7.1 Addressing Research Hypotheses and Questions

Findings from this dissertation confirmed and addressed the following hypotheses outlined in Chapter 3:

It was confirmed in Part 1 that large homes and homes part of continuums of care were associated with TF practices. For-profit homes were associated with RCC practices. Home areas that had undergone recent renovations were also associated with RCC practices and inversely associated with TF practices. It was not found that homes that were part of a chain were associated with either care practice. It was confirmed that residents eating in dining rooms that had a higher number of staff involved in eating assistance was associated with TF practices. It was not confirmed that dining rooms with a higher number of residents requiring physical eating assistance or a higher ratio of residents per staff involved in eating assistance was associated with more TF practices. Part 1 did not find that residents in dining rooms with more family/volunteers involved in eating assistance or dining rooms in specialized dementia home areas were associated with RCC practices. It was confirmed that residents at risk of dysphagia and those with poor oral health were associated with TF practices, and that being male and having a higher dependency on ADLs were both inversely associated with RCC practices and positively associated with TF practices. It was found that a higher number of prescribed medications was inversely associated with TF practices. It was not confirmed that resident age, BMI, CPS (+3), ABS, DRS, and total number of

medications were associated with either type of care practice. It was confirmed that residents who required physical eating assistance "Often" was inversely associated with RCC practices and positively associated with TF practices. Lastly, it was confirmed that residents requiring physical eating assistance experienced a greater proportion of TF practices as compared to residents who ate without assistance.

In Part 2 it was found that residents who received family member/volunteer eating assistance were significantly more likely to be at risk of dysphagia and live in a specialized dementia home area, as compared to residents who only received staff assistance. The primary hypothesis that residents who receive family member/volunteer eating assistance consumed significantly more energy and protein at meals as compared to when only staff provide assistance was confirmed.

Finally, Part 3 confirmed the primary hypothesis that residents with sensory and verbal communication impairments and those who wayfare at mealtimes are significantly more likely to be malnourished than residents without these specific impairments. It was confirmed that more TF practices and fewer RCC practices were associated with being malnourished. It was confirmed that residents who receive family food support are less likely to be malnourished, however, family member/volunteer eating assistance was associated with resident malnutrition.

These studies are non-experimental and cannot speak to cause and effect, yet they provide further insight into the precariousness of the most vulnerable residents with eating and other mealtime challenges. This dissertation identifies a pattern in the provision of care received by these vulnerable residents; *as the level of resident dependence increases, quality of mealtime care decreases*, and specifically becomes less person- and relationship-centred. However, with this statement we must also consider the conditions of care that combine and compound to produce such a pattern. The implications of our findings do not lie solely on specific caregivers or even home leadership but extend towards the cultural space of LTC within Canada. This work also suggests there is opportunity to consider how RCC practices may overcome eating

challenges and promote food intake, decrease malnutrition, and improve the mealtime experience for these residents. Two avenues are considered to ensuring the provision of RCC and PCC practices to all residents including those with eating and other mealtime challenges: 1) developing staff training on how to assess and support eating and other mealtime challenges, challenges with the expectation of relationship-centred mealtimes for all residents, and 2) evolving the macro, meso, and micro-level structures around LTC so that RCC, and thus PCC, can occur at mealtimes for all residents.

7.2 Driving Home the Message: Pleasurable Mealtime Experiences Are for Everyone, Including Residents Who Experience Eating and Other Mealtime Challenges

This dissertation provides insight into the mealtime experience in Canadian LTC homes and more specifically of those residents who face eating and other mealtime challenges. While those experiencing these challenges form a subsample of the M3 Study, the majority of residents living with dementia will eventually experience some form difficulty with independent eating (Giebel et al., 2015), making this aspect of mealtime care particularly crucial for social and nutritional reasons. The evolution of this field of research and practice including identifying, understanding, assessing, and addressing eating challenges among RLWD in formal care contexts has made significant progress since the late 1980-90s, at which time researchers and clinicians primarily focused on describing and interpreting the "feeding problem" (e.g., Volicer et al., 1989) and its impact on nutritional intake (e.g., Du et al., 1993). However, based on the current evidence and findings presented in this dissertation, considerable work remains to be done, including a closer examination of how resident sensory and communication impairments contribute to poor mealtime experiences and thus poor food intake. More recent research – including this current dissertation – positions mealtimes as complex processes, and consequently views eating and mealtime challenges and their association with food intake and nutritional status as a relational interaction between individual and context (Gibbs-Ward & Keller, 2005; Keller et al., 2014; Murphy et al.,

2017; Volkert et al., 2015) (Figure 2.1). Based on this dissertation's findings, the experience of mealtimes for those residents included in the M3 Study who required physical eating assistance and other mealtime challenges can be classified as inadequate - at minimum - and requires greater attention.

In Part 1 it was identified that residents requiring eating assistance was associated with receipt of more TF and fewer RCC mealtime practices and in Part 2, when family/volunteers provided assistance, residents ate more; RCC practices were also associated with less malnutrition in Part 3. It can be surmised that mealtime and eating assistance relationships are important. Reflecting on M3 resident participants' social locations, we recognize their unique position in regard to the extent to which their psychosocial and physiological mealtime needs are met or unmet as being tied to their social relationships. Meaning that the extent to which these relationships enable or undermine not only a resident's autonomy, but their food intake and nutrition status, is *relational* to the background of their social conditions (e.g., staff support, family involvement, built environment, home policies, government regulations, economic-political climate). In this dissertation, upholding a residents' relational autonomy was understood as mealtime care that applied RCC principles (Part 1, Table 4.4), while TF practices undermined autonomy (Part 1, Table 4.5). Results presented in Table 4.5 of Part 1 identify the frequency of specific mealtime care that diminished residents' relational autonomy, including practices that are not only task-focused but also exclusionary, objectifying, disabling, socially isolating, and in the most extreme cases, abusive with the use of force-feeding tactics (Hung & Chaudhury, 2011; Palese et al., 2019a; Watkins et al, 2017). For example, analysis of the M-RCC individual items found that residents who required the highest level of physical eating assistance were statistically more likely to be discouraged from participating in mealtime tasks, such as self-feeding, as compared to those who 'Sometimes' and 'Never' required assistance. Discouraging mealtime participation can disrupt a resident's relationship with food and eating rituals, undermine resident dignity, promote social exclusion, expedite resident eating disabilities (Genoe et al., 2010; Hung & Chaudhury, 2011; Keller et al., Slaughter et al., 2011). Keller and colleagues (2017x) found that total eating assistance (i.e.,

'Often' requires eating assistance from Ed-FED-Q) resulted in improved food intake as compared to those who 'Sometimes' require eating assistance, however, in Part 3 of this dissertation it was found that overall eating challenges as determined by the Ed-FED-Q total score was associated with malnutrition (Supplementary Table 6.1), and the identification of sensory and communication impairments and resident wayfaring in multi-variable models suggests that the causes and presentation of eating challenges are more complex than what is currently understood. Importantly, RCC practices during mealtimes did not remove the effect of these resident impairments on malnutrition, indicating that other factors in addition to social interactions need to be considered, such as aspects of the physical dining environment. Currently staff are not explicitly trained on the social aspects of providing eating assistance beyond the use of positive reinforcement to encourage food intake (e.g., Abdelhamid et al., 2016; Liu et al., 2015), nor how to specifically encourage individuals without taking over the eating assistance role (e.g., Slaughter et al., 2011). Prior research has attempted to train staff and volunteers on individualized assistance, but social interaction and RCC are not explicitly the focus in eating assistance interventions (Green et al., 2011; Liu et al., 2015).

Support with eating and participation in mealtime rituals may be particularly important for those residents with vision loss, communication challenges and wayfaring, which are commonly associated with the progression of dementia (Faraday et al., 2021). Wayfaring among RLWD was not prevalent at 3.9% of residents in the M3 sample, however, this characteristic had the highest odds ratio (OR=3.5, CI=1.43, 8.66, p<0.01) for being malnourished. Residents who wayfare during a meal are not only likely have reduced food intake, but also increased energy expenditure, and thus the noted association with malnutrition. Over a quarter of the M3 resident sample experienced serious verbal communication challenges and almost 20% lived with significant vision loss (including with use of usual aids). Vision loss has been identified as a risk factor for malnutrition (Well & Dumbrell, 2006), yet it is often not directly addressed within dietetic practice or eating assistance intervention literature (e.g., Dietitians of Canada, 2019; Liu et al., 2015). A recent publication indicates that LTC staff have a low capacity to support RLWD with sensory impairments (Dawes et al., 2021), which may help to explain

associations with malnutrition (Part 3), increased TF practices (Part 1), and dedicated eating support from families among nutritionally vulnerable residents with eating and other mealtime challenges (Parts 2 and 3). Typically employed techniques to support residents with eating challenges, such as verbal prompts but more so visual prompting (e.g., Liu et al., 2015), may be inappropriate for residents with cognitive and sensory impairments and those with verbal communication challenges, and can result in a cycle of residents responding with frustration (or what is referred to within the biomedical community as "behavioural psychological symptoms of dementia"; e.g., McKeith et al., 2005), followed by increased TF practices from staff, leading to further frustration from residents, as was found by Lee and colleagues (2020) in their longitudinal, observational mealtime caregiving study. In such instances, staff may feel further compelled to divert from best-practices and use other tactics to ensure adequate food intake, such as begging, bribing, intimidation, and in rare cases force feeding, as was reported in Part 1 (Kayser-Jones & Schell, 1997; Liu et al., 2020b; Palese et al., 2019a).

Sensory and communication impairments are also not explicitly accounted for within widely adopted eating challenges and malnutrition risk assessment tools. For example, items from the Ed-FED-Q address such scenarios as whether there is "spillage while feeding", whether a resident "turns his head away while being fed", or if a resident "tend[s] to leave food on the plate at the end of the meal" (Watson & Deary, 1997, p.406). Similarly, the PG-SGA does not identify sensory impairments as risk factors when assessing for nutrition status among residents (dos Santos et al., 2015; Ottery, 2000). This is likely a result of the PG-SGA being initially developed for outpatient oncology populations and the Ed-FED-Q focused on eating changes typically observed in the progression of dementia. The failure to recognize and connect vision, hearing, and communication challenges with malnutrition is problematic. Further, a recent publication by Dawes and colleagues (2021) found that staff are ill equipped to screen residents for sensory impairments and support the use and maintenance of assistive devices, though they recognize the importance of providing this type of support. Research has shown that persons living with dementia benefit from hearing and vision interventions, including increased quality of life, improved functional ability and

communication, and a reduction in responsive behaviours (Dawes et al., 2019). There is a pressing need to prioritize individualized care for residents with sensory impairments by developing complex interventions tailored for implementation in LTC settings, which include education and training components for staff that are needed to support RLWD with these unique challenges (Dawes et al., 2021).

Residents who experience eating and other mealtime challenges are entitled to pleasurable dining experiences and opportunities to connect with those who are providing assistance. For this to happen, more research is needed to understand the relationship between the experience of dementia and sensory and communication challenges, and their impact on both social and nutritional aspects of dining within LTC, as well as development of interventions to that support staff to provide RCC despite these challenges. Specifically, education and complex interventions are needed to support staff in first, recognizing the diversity of challenges among residents who require eating assistance - which include sensory and communication support for nutritionally vulnerable residents, and secondly, creating working conditions in which staff receive ongoing training and specialist support when needed (e.g. occupational therapy), adequate time is provided to conduct these assessments, and training on care techniques that are relationship-centred focused are regularly offered to provide this type of skilled mealtime care (Barken & Armstrong, 2018; Simmons & Schnelle, 2004).

7.3 From LTC System to Dining Room: Fostering Relationship-Centred Mealtime Care

Findings in this dissertation build on previous research to provide new insight into the capacity for mealtimes to be relationship-centred. We have identified a trend of decreased RCC practices among those who are most in need of mealtime support, as well as distinguished between key aspects of RCC that are prioritized and those which are neglected among this subset of residents (Part 1). We have also identified other

contributing factors that are often not considered in relation to mealtime challenges, such as vision and communication impairments associated with residents living with dementia. In short, social engagement (e.g., less likely to be included in staff social conversation), exercising choice and self-determination (e.g., less likely to be asked meal preference), and the right to dignified eating assistance (e.g., more likely to be forced/coerced into eating) continue to be functions of mealtimes deemed irrelevant or too challenging to support for these vulnerable residents. Despite continued progress in this field through research and culture change efforts, the crux of the matter that is often forgotten - or simply ignored - is that *residents who experience eating challenges are entitled to pleasurable mealtime experiences.* It could even be suggested that this most vulnerable group should be the focus of RCC practices due to their limited capacity to negotiate other social situations within the home that would typically support the fostering of meaningful relationships. Using this dissertation's conceptual model (Figure 2.1) framed by relational theory, the remainder of this chapter discusses the conditions that potentially impact staff mealtime care and family mealtime involvement and the capacity to create relationship-centred mealtimes through complex interventions given the current climate of LTC care in Canada.

Relational theory necessitates the need to make explicit the multiple ways in which we are all interdependent (Sherwin & Winsby, 2010). In the context of LTC, Figure 2.1 adopts a relational lens to understand the interdependence between residents, staff, and families, nested within multiple layers of structures and systems that impact mealtimes within homes. Understanding what, how, and why certain types of mealtime care are provided to residents requires us to examine the conditions in which that care was provided. The latter is undeniably harder to address and perhaps helps to explain the incongruence between the growing number of academic publications and interventions developed to support the adoption of social models of care, the modest progress made to adopt and sustain these models within LTC homes, and the slight "movement of the needle" in the broader culture change movement (Moore et al., 2016; Rockwell, 2012; Shier et al., 2014).

Although overall RCC practices were more common than TF practices, for residents with eating and other mealtime challenges, TF practices predominated. This finding may be indicative of the priorities of larger systems and structures. Using the same M-RCC item as an example that was discussed in the previous section that captured resident discouragement from participating in mealtime tasks (Part 1, Table 4.5), we reflect on potential relational reasons *why* this practice was observed among almost 70% of residents with the highest level seen in those requiring physical eating assistance. The ability for staff to encourage a resident's mealtime participation, such as self-feeding, requires them to apply eating assistance techniques that support both resident functioning and dignity – that in itself encompasses foreknowledge of the resident's needs and preferences (Liu et al., 2020b) and a relationship with that resident based on trust and respect (Hung & Chaudhury, 2011). It also requires adequate training on such restorative techniques (Batchelor-Murphy et al., 2017), a supportive physical dining environment (Chaudhury et al., 2013), and home leadership that ensures sufficient staffing levels (Havig et al., 2011) to allow for adequate time to assist that resident (Simmons & Schnelle, 2004). It also needs to be recognized that resident participation in mealtime activities may result in a less efficient meal, albeit a more meaningfully one, and thus more time needs to be dedicated to the meal. In other words, the ability for a resident with eating challenges to participate during mealtime to their fullest potential is dependent on whether or not staff have the capacity and relational autonomy to promote this type of participation.

Individual resident characteristics can play a significant role in the type of mealtime care provided by staff, however, other factors, size of home, funding structures, continuums of care, and investments into physical renovations contributed to the conditions of work for staff, which in turn impacted resident mealtimes (Part 1, Table 4.2; Liu et al., 2019). What is also notable in this dissertation, is that hypothesized associations between TF and RCC mealtime practices and home characteristics were not all confirmed. Specifically, for-profit homes in this study, although a minority in the sample, were more likely to have RCC practices, while being a continuum of care and a larger home was associated with more TF practices. Residents living in home areas that had been

renovated in the past 5 years had more RCC and fewer TC practices. Number of residents requiring assistance and the resident:staff involved in eating assisting were not associated with RCC and TF practices, whereas higher numbers of staff involved in assisting was associated with more TF. This suggests that low staffing levels, in addition to other interacting factors, such as staff attitudes towards the purpose of mealtime, staff work-flow, and home prioritization on efficiency, should be considered. This analysis demonstrates that RCC mealtimes are more complex and we must move beyond these obvious and easy to discern LTC characteristics often used to describe 'quality of care' and more deeply consider macro-level (i.e., government policies and LTC sector regulations) and meso-level factors, such as workplace culture, standardization of care and leadership that dictate the micro-level factors of work assignments, work intensity, prioritization of mealtime activities (e.g., task of finishing meal vs. socially engaging) and supervision (Baines & Armstrong, 2018). To date, research focused on the working conditions of those in LTC appear to be consequences of socio-political-economic approaches (i.e., neoliberalism) that favour private markets and support governance models centred on cost-efficiency and outcome measures at the expense of good care (Cunningham et al., 2013; Harrington et al., 2015). The consequences of such tactics are reflected in the key results of this dissertation, where RCC is less common among those who require the most mealtime support, and family members supplement system gaps through unpaid essential care. Efforts to effectively foster RCC or any form of social care within the current LTC context requires that we expand our efforts to address not only micro-interactions during mealtimes but broader structures that shape living and working conditions within LTC homes; to do this a fundamental shift of Canada's healthcare system is required.

To foster RCC within Canadian LTC homes, Baines and Armstrong (2018) offer eight practices at the micro-, meso- and macro-levels that would ensure dignified living and working conditions for residents and staff: 1) provide adequate staff and an appropriate staff mix (e.g., staff from various disciplines have time and space to respond to residents' mealtime care needs); 2) a stable workforce (e.g., consistent and permanent staff to build strong relationships with residents and families by knowing individual

mealtime needs and preferences); 3) time (e.g., prioritizing time dedicated towards the building of relationships with residents and families during mealtimes, less time conducting documentation); 4) standards (principles) effectively enforced and funded (e.g., standard principles upon which staff can provide evidence-based mealtime care versus standardization which allows for little flexibility in care approaches and mealtime processes); 5) appropriate training and education (e.g., hands-on training focused on resident social and complex care needs around eating assistance); 6) appropriate working conditions (e.g., wages and benefits reflective of job requirements to ensure stable workforce and staff autonomy to apply their own professional and personal judgement to mealtime care); 7) an integrated system (e.g., discontinuation of sub-contracted dietary positions to strengthen community between staff and residents during mealtimes); and 8) tolerating some risks (e.g., supporting residents to participate in mealtime rituals, like food preparation). The findings from this dissertation, in particular Part 1, offer a starting point that identifies specific relationship-centred mealtime practices that, if prioritized through the application of any of these eight principles, would improve the mealtime experience for *all* residents, staff, and families.

The implementation of practices that would foster RCC mealtimes within LTC necessitates alignment with federal standards (Armstrong & Cohen, 2020; Estabrooks et al., 2020). As discussed earlier, the COVID-19 pandemic has made long-standing issues in this sector hyper-visible and has prompted expert groups to take action, such as the formation of Canada's National LTC Services Standards Committee (Health Standards Organization, 2021). Transformation within the LTC sector requires principles to ensure a shared, equitable approach to addressing the needs of diverse care contexts across Canada. Armstrong & Cohen (2020) suggest seven pan-Canadian foundational principles specific to the continuing care system that prioritizes vulnerable populations utilizing LTC services, family and other unpaid carers, and marginalized and undervalued workforce: 1) accountability and transparency; 2) evidence-informed policy development; 3) a focus on health promotion and the social determinants of health; 4) relational care and support; 5) comprehensive, integrated, community/neighbourhood-based delivery; 6) access based on need and not on ability to pay; 7) not-for-profit

delivery. The current climate of the LTC sector indicates that not only new standards are needed to improve the conditions of work and thus care, but also the movement away from traditional measures (i.e., standardized assessments) towards the application of unorthodox indicators which capture conditions that have the most impact on care contexts, particularly the adoption of social care models. For example, minimum staffing levels, prescription drug use, access to and use of incontinence pads, and ownership and payment patterns (Armstrong et al., 2012; Liu, Maxwell, Armstrong, et al., 2020; McGregor & Harrington, 2020; Ronald et al., 2016). Without transformation at the system level, the ability for LTC homes to implement and sustain relationship-centred mealtimes will largely remain limited within the confines of standardized practices and policies (Harnett & Jöhnson, 2017).

## 7.4 Future Research: Directions for Mealtime Interventions

Interventions to improve the mealtime experience and resident food intake have increased over the past two decades and have included food-focused modifications (Abdelhamid et al., 2016) and physical modifications of the dining environment (Chaudhury et al., 2013). Programs targeted specifically for residents with eating challenges employ behaviour-focused techniques, such as Montessori-based eating activities (Camp et al., 1997) and spaced-retrieval methods (Vance & Farr, 2007) designed to engage residents in a combination of activities and verbal cues to improve food intake. However, as identified by Abdelhamid and colleagues (2016) in their review of interventions directed at improving food and fluid intake among residents, few interventions include strong social elements around eating and drinking despite demonstrating the most promise among interventions considered. These social-focused intervention studies apply outcome measures such as resident participation in mealtime tasks, quality of interactions, communication, and happiness, concepts that are equally important and vastly different to those commonly used such as changes in body mass index, dependence in ADL, and food intake (Abdelhamid et al., 2017). The strength of

the relationship between the person providing assistance and the person receiving assistance (i.e., RCC based on therapeutic relationships) continues to be ignored as a factor in intervention research, thus it is not surprising that no intervention to date has focused on the potential benefits of family members providing eating assistance (e.g., Backhaus et al., 2020), though research indicates potential social and nutritional benefits (Durkin et al., 2014; Tsai et al., 2020), as was found in Parts 2 and 3 of this dissertation. This doctoral research also identified sensory and communication impairments as being important factors for consideration regarding prevention of malnutrition, however, we suspect that no eating assistance intervention to date explicitly accounts for these particular mealtime challenges among residents who require eating assistance.

Discussed in the previous section is the need to account for LTC home policies and system factors that impact the conditions of work and care, and thus would play a critical role in facilitating or hindering the implementation of mealtime interventions. Implementation literature in the area of LTC, specifically behaviour change techniques, are often focused on modifying individual-level factors and typically do not adequately account for context. However, outliers do exist, for example Charras & Fremontier (2010) intervention study where staff and residents dined together during lunch times required the LTC home's administration to stagger staff breaks and provide reduced meal prices for staff to encourage family-style dining. The interventionists understood that staff's ability to socialize and dine with residents is relational to home policies, procedures, and funding of the home that hinder or support that mealtime practice (Charras & Fremontier, 2010). More recently, an innovative complex intervention called the CHOICE+ Program developed by Keller et al. (2020) employs a participatory approach that involves staff, residents, families, volunteers, and home middle and senior management to create and sustain relationship-centred mealtimes in a particular dining room. By involving all stakeholders in identifying mealtime improvements, a relational approach is taken towards intervention components and that specific context of care. In addition, CHOICE+ provides specialized education and training for middle and senior management in order to improve program implementation and sustainability

through home policy modifications to support RCC practices and initiatives from staff, residents, families, and volunteers (Wu et al., in press).

There is a need within LTC intervention research to adopt a relational understanding of how each program component functions in relation to the other and within the broader realities of practice change. Sustainability of social models of care remains one of the last frontiers within the field of implementation science in LTC sector (e.g., Berta et al., 2019) for two reasons: 1) intervention components do not account for or address the modification of home policies and procedures to support the areas for improvement; and 2) LTC system policies and regulations largely do not support social models of care (Baines & Armstrong, 2018; Caspar et al., 2016; Stirman et al., 2012).
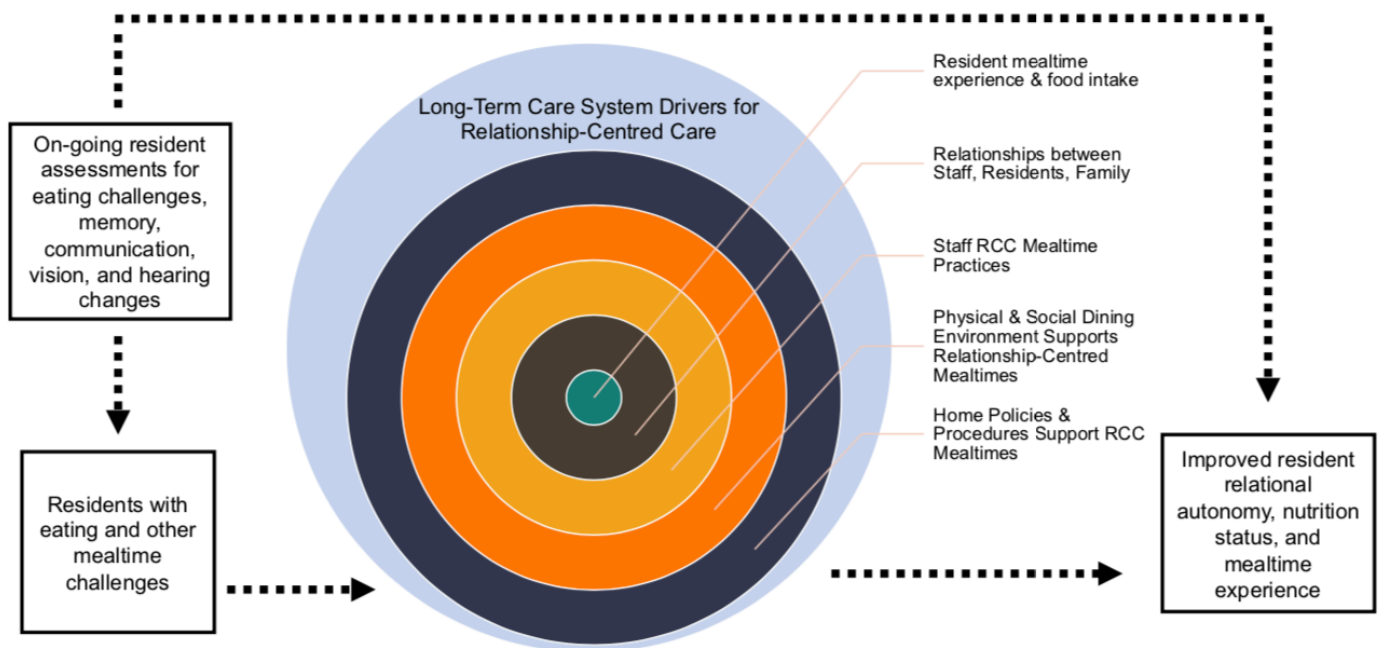
Abbreviation: RCC= Relationship-Centred Care

Figure 7.1. Conceptual model for complex relational interventions targeting residents with eating and other mealtime challenges in LTC homes

Based on previous research and the development of the CHOICE+ Program (Keller et al., 2020; Wu et al., 2018), HHK and SAW propose a conceptual model (Figure 7.1) that provides the basis for developing complex relational interventions to improve nutritional status and well-being of residents, specifically targeting residents with eating and other mealtime challenges as they are the most vulnerable. Specifically, there is a need to consider other factors that may contribute to the conditions of staff mealtime RCC practices (Figure 2.1) beyond staffing levels and resident:staff ratios, that focus on the conditions of work, such as job satisfaction and staff-family relationships. Complex, relational interventions would begin with the assessment for physiological, cognitive, and social challenges that a resident with eating challenges would experience during mealtimes, including cognitive impairment, communication challenges, and vision and hearing loss. Using a similar nested relational framework as Figure 2.1 (Nedelsky, 2011), we capture multi-level factors that interact with one another and the next set of nested relations that facilitate or impede RCC mealtimes for this specific group of residents that can be the target for interventions. These targets include LTC system drivers (e.g., regulations, size of home, ownership models, funding structures), home policies and procedures (e.g., staffing levels, safety regulations, organizational culture, leadership), physical dining environment (e.g., size of dining room, lighting and noise levels) and social dining environment (e.g., social engagement, seating arrangements), relationship between staff, residents, and families (e.g., staff mealtime practices, family participation, resident interactions with staff and families), and resident mealtime experience (e.g., participation and inclusion at mealtime, support of relational autonomy, staff roles and support) and food (e.g., preferences met, choices/options, cultural foods provided). It is contended that if interventions that target home policies, staff mealtime practices, promote relationship-centred mealtimes and family inclusion, will result in improved resident mealtime experience and food intake for those with eating and other mealtime challenges.

To move this research agenda forward, the following are some examples of intervention components that could potentially comprise complex relational interventions that benefit those most vulnerable with eating challenges:

- Modification of LTC home regulations and policies to facilitate RCC mealtimes; for example, expectation of staff to facilitate social interactions, flexible mealtime schedules to allow for more time to provide RCC eating assistance
- Hands-on staff and family education and training on restorative eating assistance techniques
- Staff and family education and training on effective communication with RLWD and those with sensory impairments
- Staff education and training on assessment and support for residents with sensory impairments
- Staff training on RCC practices during eating assistance; how to socially engage, mechanism for family members who provide regular eating assistance to inform staff of RCC techniques that resident prefers
- Physical dining room modifications to support mealtime ambiance and resident relational autonomy and functioning e.g., lighting, way finding, reduced size of dining rooms, open servery, etc.

7.5 Strengths and Limitations

The M3 Study makes significant contributions to our understanding of mealtimes within Canadian LTC homes. From resident nutrient intake to home- and system-level factors, this seminal study has allowed for the comprehensive, relational insight needed to identify factors associated with mealtime care provisions, food intake, and malnutrition among nutritionally vulnerable residents.

Strengths and limitations for specific studies are included within each chapter. The cross-sectional design of the original M3 study prevents conclusions related to causality between variables and dependent variables, including staff care practices, resident food intake, and resident nutrition status. Purposive sampling of M3 LTC homes did not

result in a representative sample of each province's LTC home sector profile, and thus findings may not be generalizable to the general population. The very nature of conducting secondary data analyses meant that authors were constrained in their ability to answer specific research questions. Specifically, variables were limited to those collected and for this thesis it would have been useful to have information on the conditions of work in relation to staff's ability to provide RCC mealtime practices, such as job satisfaction, employment status (e.g., part-time, full time), work experience, and training in PCC or RCC practices. These variables may have provided further insight, particularly in Part 1, where multivariable regression analyses explained factors associated with TF practices, with fewer that helped to explain associations with RCC practices. In addition, more information on family food involvement (e.g., eating out of the LTC home on a routine basis) would have provided a deeper understanding of how the efforts families make to maintain relationships and the extent of the impact they have on residents' care and quality of life within formal care spaces. Finally, resident perspectives on their mealtime experiences using qualitative and quantitative data collection methods would have captured first-hand experiences of commensal eating within these homes.

Chapter 8: Conclusion

Mealtimes in LTC homes play an important role in fostering and maintaining important relationships between staff, residents, and families. For residents who experience eating and other mealtime challenges, the mealtime care they receive is even more critical to promoting nutritional status and honoring their relational autonomy and dignity. This dissertation focused on those who are in need of the most nutrition care within our Canadian LTC system: those who struggle to eat on their own, who more often than not, live with moderate to advanced dementia. The three parts of this doctoral research work together to provide a relational understanding of the complexities of mealtimes, specifically multi-level factors that impact the conditions of mealtime care, the contributions that families make to ensure resident food intake, and the social vulnerability of malnourished residents who experience sensory, communication, and cognitive impairments.

The application of relational theory (McCormack, 2001; Nedelsky, 2011) within this body of research has helped to demonstrate the interdependence between those who live, work, and contribute to LTC communities, thus providing further impetus to reconsider the conditions of work and mealtime care within this context. The COVID-19 pandemic has made clear the urgent need to address long-standing issues within the LTC system and significant changes to government policies and regulations are the keystone to transforming Canada's LTC sector. Those with lived experience with the support from advocacy groups, providers, researchers, and policy makers are equipped and willing to face these challenges. In tandem, innovative models of social care that account for resident, staff, family, leadership, home, and system factors paired with novel participatory approaches will be crucial to fostering relationship-centred mealtimes, and ultimately moving Canada's culture change movement forward.

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