

Mount Saint Vincent University

Department of Family Studies and Gerontology

Assessing the Physical Environment in Adult Day Programs for  
Persons with Dementia

by

Thea Brown

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### **Dedication**

I dedicate this work to my Nana. Her love for life, strong relationships and unselfish acts of kindness were truly an inspiration for me. I knew that when I looked forward to my dates with my Nana and her group of 80-year-old friends, gerontology was my vocation.

To my encouraging, caring, understanding and loving fiancé, Alex —for always being there with me, even from afar, for his patience, and everlasting support; for believing in me and helping me to become a stronger, more dedicated and passionate person in all that I do.

To my parents, Sue and Allan Brown – who taught me to always challenge myself and to constantly broaden the breadth of my knowledge. Through particularly thick and predominantly thin, they have continuously stood by my side and I will forever be wholeheartedly indebted to them.

## **Assessing the physical environment in adult day programs for persons with dementia**

### **Abstract**

This research assesses physical environments in adult day programs in Nova Scotia in terms of their appropriateness for persons with dementia. Researchers have found that when physical environments are well designed, they can significantly compensate for decreased cognitive ability and can impact the behaviour and well being of people with dementia. The Personal Environment Fit Model (Lawton & Nahemow, 1973) is used in this study as it recognizes that behaviour and affect are outcomes of a person's level of competence interacting with an environment's level of press.

This study reports the reliability and validity tests of an adult day program physical environment assessment tool (ADPPEAT) designed by the author. Additionally, an assessment of the extent to which adult day program environments in Nova Scotia implement the key physical environment design principles follows. All adult day programs (N=27) were included in the cross-sectional design of this study. A sub-sample of four centres were re-assessed for reliability purposes. Descriptive information is presented on characteristics of the programs: type and number of clientele, hours and days of operation, services offered, funding sources and information on support networks.

The results of this research indicated significant relationships between different categories of adult day programs and their implementation of the physical environment design principles. Adult day programs that were supported with District Health Authority (DHA) and/or Department of Health and Wellness (DHW) funding were found to have significantly more design features that provide safety and security, opportunity for

meaningful activities, opportunity to function independently and space for the staff, than adult day programs that were not supported with DHA/ DHW funding. Adult day programs that were open for a full day and operating 2+ days a week were found to have significantly more design features that provide safety and security and opportunity for meaningful activities, good ‘visual access’ and functional independence within the program for persons with dementia than adult day programs operating 1 day a week; 40.7% of adult day programs operate 1 day a week.

The relative importance of the design in creating a dementia friendly physical environment in community-based services is demonstrated in the findings of the research. Nevertheless, it is acknowledged that people with dementia do not experience themselves and their physical and social environments as separate. Each element, the personal, physical and social, comprise an integral piece to understanding the experience of the person with dementia. Future research would benefit from incorporating an assessment of the supportive environment (programming, staff-client-family- relationships) in adult day programs to capture a more holistic approach.

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## **Introduction**

### **Problem Statement**

#### **Context of dementia in Canada.**

The progressive nature of Alzheimer's disease or other related dementias (ADRD), with no known cure, creates increasing, changing, and unrelenting demands on family caregivers (Markle-Reid & Browne, 2001; World Health Organization (WHO), 2012).

For the purpose of this paper ADRD will from now on be referred to as dementia.

Advanced dementia may result in extreme functional disability, behavioural problems, and increased dependence on others (Chappell & Penning, 1996).

In Canada, there are about 60,150 new cases of dementia each year and currently there are about 500,000 people with all forms of dementia. This figure is expected to double over the next 30 years (Alzheimer Society of Canada, 2010; Chertkow, 2008). "Between 2% and 10% of all cases of dementia start before the age of 65. The prevalence doubles with every five-year increment in age after 65" (WHO, 2012, p. 8). With the aging population, increasing life expectancy and increasing prevalence of dementia in Canada, a drastic increase in home care expenditures is expected (Health Care Council of Canada, 2012). The net economic cost of dementia in 2008 in Canada was estimated to be at least \$15 billion and is estimated to reach \$153 billion by 2038 (Alzheimer Society, 2010). Yet the allocation of funding to home care and community care supports has not kept pace with the increased demand for services (Markle-Reid et al., 2008).

Half of persons with dementia reside in the community and up to 90% of their care is provided for by family and friends (Chappell, Strain, & Blandford, 1986; Forbes et al., 2008). Typically, the spouse is the first choice of caregiver, and if available,

becomes the primary source of caregiving (Health Canada, 1998; Keefe & Manning, 2005). However, if the spouse is unable to provide care, adult children will often take on this role (Health Care Council of Canada, 2012; Keefe & Manning, 2005). In 2007, the number of Canadian caregivers aged 45 years and older was 2.7 million and 75% of eldercare was provided by those between 45 and 64 years of age (Cranswick & Dosman, 2008). “A total of 13% of caregivers reported that their work situations were impacted by caregiving. More than 50% of those caregivers whose work was impacted reported they needed to reduce or modify their work hours in order to accommodate caregiving, and nearly one-third used their sick days and vacation days to do this” (Health Care Council of Canada, 2012, p. 29). Among those family/friend caregivers caring for someone in the community, those caring for a person with dementia carry a heavier burden and are more likely to experience higher levels of social isolation, health problems, depression, stress, fatigue, financial costs and a need to change a working situation, than those caring for non-demented elderly persons (Black et al., 2010; Health Care Council of Canada, 2012; WHO, 2012).

“From a broad policy perspective, decision makers should be advised that providing care to loved ones is something that is typically valued by caregivers and care recipients alike and that many caregivers would prefer to provide care themselves rather than have paid care providers come into their homes” (Hollander, Liu, & Chappell, 2009, p. 48). In order to support caregivers in their caregiving role, particularly caregivers of persons with dementia, it is important for governments to explore options that provide support through quality community care services that allow the care recipient to remain in the home and provide the caregiver with the necessary respite (WHO, 2012).

**Shift to home-care services.**

The shift in services from long-term and acute care to home and community care are a result of the efforts to reduce the financial burden placed on the healthcare system and to more effectively address the future care needs of an aging Canadian population. “Research projects in the provinces of Nova Scotia (Greenwood, 2006), Quebec (Béland, Bergman, Lebel, & Clarfield, 2007; Hébert et al., 2007), and British Columbia (Rigg, 2006) as well as nationally (e.g., Hollander & Chappell, 2001; Hollander, Chappell, Havens, McWilliams, & Miller, 2002)” (as cited in Forbes et al., 2008, p.92) have demonstrated that home care and home support services are a cost-effective substitute for more expensive services provided in acute and long-term care facilities. For example, “1,121 homecare clients in Nova Scotia who received additional supportive services to stay at home were compared with similar long-term care residents. A savings of \$30 million per year was achieved” (Forbes et al., 2008, p. 92). Services such as in-home nursing, meal delivery, adult day programs (ADPs), respite services and personal care support can significantly reduce premature use of institutionalization and hospitalization due to symptoms of caregiver burden, resulting in a reduction of health care expenditure (Biegel, Bass, Schulz, & Morycz, 1993; Gaugler, Zarit, Townsend, Stephens, & Greene, 2003; Hebert, Dubois, Wolfson, Chambers, & Cohen, 2001). With the increasing aging population, high prevalence of dementia, and shift in services, the need for community services, has grown across the provinces of British Columbia, Saskatchewan, Manitoba, Alberta, Ontario and Nova Scotia (MacAdam, 2011; Sambrook et al., 2004).

Recently in Canada, there have been initiatives in the provinces to create quality care environments in nursing homes and long-term care facilities that focus on the

importance of the physical environment, which has gained a higher profile relative to dementia care in the long-term care sector. Researchers have found that when physical environments are well designed, they can significantly compensate for decreased cognitive ability and can greatly impact the behavioural and psychological well being of people with dementia (Davis, Byers, Nay, & Koch, 2009; Day, Carreon, & Stump, 2000; Hodges, Bridge, & Chaudhary, 2006; Lawton, 2001). When an environment is poorly designed, maladaptive behaviours and adverse effects result and have been found to affect the individual with dementia, the family and staff in the areas of quality of life, safety and stress (Day et al., 2000; Jones & van der Eerden, 2008; Lawton & Nahemow, 1973).

Despite the initiatives in long-term care, there is an absence of research exploring the physical environment in community settings, presenting a notable gap in our understanding of the extent to which community-based service environments are supporting/ hindering persons with dementia. This gap in knowledge has led to fewer resources and less promotion of and support for community-based services, leading to an absence of dementia-friendly environments across the country.

This research project developed and tested the reliability and validity of an instrument that measures the presence or absence of environmental design principles in ADPs, which have been found to support the behavioural and psychological needs of persons with dementia. The instrument was used to assess Nova Scotia's ADP environments in order to provide detailed information about the suitability of the physical environments for the dementia population and to recognize physical environment design in community-based services as a key element in offering community-based services.

Decision makers need to understand that the increasing emphasis placed on home care and community care services to alleviate strain on the healthcare budget may not be a cost-effective shift if the current service environments are not meeting or supporting the needs of the increasingly prevalent dementia population. “The lack of awareness and lack of infrastructure for providing timely and appropriate support early in the course of the disease increase the likelihood of high costs of supporting increased dependence and morbidity” (WHO, 2012, p. 8).

As our population ages, the importance of the physical environment in community-based services must be further explored to increase our understanding of how these services contribute to and support the needs of persons with dementia and their caregivers, as well as to redress any identified barriers and make the necessary changes. Until such time a cure is found, the best hope for people with dementia is to concentrate efforts on interventions to improve quality of life. The appropriateness of the physical environment in which these interventions occur contributes to their success and merits consideration (Brawley, 1997).

### **Conceptual Framework**

#### **Lawton and Nahemow’s personal environment fit model.**

The Personal Environment Fit Model (Lawton & Nahemow, 1973) is the conceptual framework upon which this research draws. Lawton and Nahemow (1973) developed this congruence model to explain how behaviours are a function of the interaction of individual factors with the physical, social, psychological, and cultural dimensions of the environment.

The model recognizes that behaviour and affect are outcomes of a person's level of competence interacting with an environment's level of press, as outlined in Figure 1.

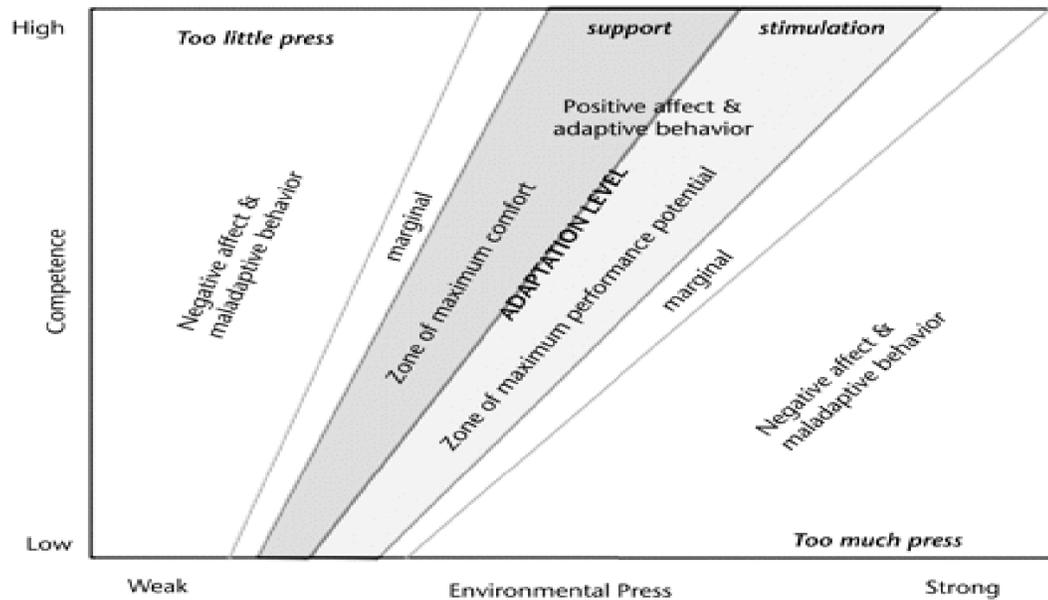


Figure 1. *Lawton and Nahemow's (1973) Personal Environment Fit Model.*

Level of press refers to the demands placed on individuals by their environment, such as dim lighting, shadows or glare. This model shows that to function at the highest level possible, a person's ability must match demands placed on it by the environment. Lawton and Simon's (1968) docility hypothesis states that too little environmental demand results in lack of stimulation, boredom, and even de-conditioning, whereas too much demand can result in stress and inability to function in the environment. According to the docility hypothesis "as the competence of the individual decreases, the proportion of behaviour attributable to environmental, as contrasted with personal, characteristics increases" (Lawton & Nahemow, 1973, p. 658). Adaptive behaviour, in the model, refers to the outer manifestation of individual competence; it is a result of the individual-environment interaction. For example, "negative" behaviours associated with dementia, such as aggressiveness and yelling, are seen by this model as maladaptive behaviour.

Affective responses refer to any internal emotional states that are involved in the environment-behaviour transaction (Lawton & Nahemow, 1973). Adaptation level refers to the individual ability to react to external stimuli in a way that the stimulus is perceived as neither strong nor weak. The individual ability to do this depends on the individual level of competence and the context in which the stimuli is perceived and experienced (Lawton & Nahemow, 1973). Individual “adaptation to the environment is promoted by designs that consider the needs and preferences of individuals, take into account deficits in cognition and function, and recognize the importance of autonomy and security” (Aud, 2002, p. 63).

Older adults with dementia are especially vulnerable to environmental stimuli. As the dementia progresses and the presence of plaques, tangles and cell damage to various areas of the brain increase, the individual adaptability levels change as cognitive abilities decline. This damage translates into such affects as “visual changes; those reported include colour perception, spatial orientation, motion perception, object and facial recognition” (Jones, & van der Eerden, 2008, p. 13). Environmental stimuli that hinder the individual’s adaptability level, such as shiny surfaces appearing wet; patterned surfaces causing illusions; and dark surfaces and shadows appearing to be holes put them at risk of maladaptive behaviours and negative affective responses. (Aud, 2002; Jones & van der Eerden, 2008; Ziesel et al., 2003).

**Assessing ADP physical environments for people with dementia using  
Lawton & Nahemow’s (1973) person-environment fit model.**

*Rationale.* Lawton and Nahemow’s (1973) Person Environment Fit Model is designed to capture the relationship between persons with specific characteristics and

specific environment design. The model provides a compelling rationale for the use of the environment as a justification for modifying features of an environment to adjust for imbalances. It is important to include design features that “support the functioning of cognitively impaired adult residents, accommodate behaviours, maximize functional abilities, promote safety, and encourage independence” (Brawley, 1997, p. 45).

Lawton classifies environments as a means of understanding how the environment impacts behaviour by three main functions of the environment: maintenance, stimulation, and support (Degenholtz, Miller, Kane, Cutler, & Kane, 2006). “The *maintenance* function refers to aspects of the environment intended to help individuals maintain their sense of self in later life. Environments that are *stimulating* provide opportunity for new experience, for example, social interaction or leisure activities. Finally, the *support* function refers to features of the environment that compensate for reduced or lost competencies” (Degenholtz et al., 2006, p. 6).

Designing more supportive community-based environments, such as ADPs, can positively impact the activities, behaviours and psychological outcomes for participants with dementia, including their ability to socially interact with others. Existing research, in the institutional context, supports the model’s position that a person’s behaviour is directly related to the design of the space, and a quality care environment is designed to meet the specific needs and preferences of the person utilizing that environment (Cohen & Weisman, 1991; Cutler, 2000; Ziesel, Hyde, & ScLevkoff, 1994). However, many older adults express the desire to age-in-place, that is, to remain in their own home/community for as long as possible (Gitlin, 2003). Community-based services such as ADPs provide a different environmental context than that of an institutional context and these spaces and

programs for persons with dementia need to be examined. As the aging population, prevalence of dementia, and shift to home-care and community-care services increase; persons with dementia will unnecessarily exhibit maladaptive behaviours if the physical environments of services are not properly designed to meet their needs.

## **Literature Review**

### **Adult Day Programs in Canada**

#### **Definition.**

ADPs are defined on the Public Health Agency of Canada (2009) website as community-based "home support" services. Attending an ADP provides support to people living at home by providing needed health services and the opportunity for socialization. ADPs provide services such as social/recreational activities in a group setting aimed at the functional, psychological and social rehabilitation of the client by means of cognitive stimulation, health monitoring, medication monitoring or administration, personal care, provision of snacks and hot meals, assistance with toileting, health care teaching, transportation, and provision of information (Baumgarten et al., 2002; Gaugler, 1999; Hedrick et al., 1993; Leitsch, Zarit, Townsend, & Greene, 2001; Schmitt, Sands, Weiss, Dowling, & Covinsky, 2010). It is believed that persons who attend such programs can continue to live at home for longer periods of time. In addition, ADPs can provide a period of respite for family caregivers (Health Care Council of Canada, 2012; Hollander & Walker, 1998; WHO, 2012). ADPs are considered as part of the maintenance and prevention model of home care "which serves people with health and/or functional deficits in the home setting, both maintaining their ability to live independently, and in many cases preventing health and functional breakdowns, and eventually institutionalization" (Public Health Agency of Canada, 2009, para.11).

#### **Adult day programs as a non-insured service in Canada.**

At the federal level, a relevant piece of legislation pertaining to ADPs is the Canada Health Act of 1984. The Canada Health Act is Canada's federal health insurance

legislation and defines the national principles that govern the Canadian health insurance system (Health Canada, 2010). The five principles outlined in the Act are; universality; accessibility; comprehensiveness, portability and public administration. The principles have particular criteria and conditions that must be satisfied for provinces or territories to qualify for funding such as imposed restrictions on user fees and billing (Health Canada, 2010). There are two types of services identified in the Act: insured health services and non-insured services called extended health care services. Insured health services include hospital care and services provided by physicians (Health Canada, 2010). Extended health care services are non-insured services and include such things as nursing homes, long-term residential care, home care, and ambulatory services (Keefe, 2002). Community-based services and continuing care services such as ADPs, and certain home care and residential care services, are also non-insured services (Alexander, 2002). Federal funding to the Provinces is conditional to their adherence to the five principles for insured health services only. Non-insured services, as a result, vary in cost, service delivery, staffing, building structure, and accessibility from one province or territory to another.

As non-insured services, ADPs are considered another location of delivering continuing care services. They are generally based on social/mixed/multipurpose models of care rather than a medical model of care. A social/mixed/multipurpose model delivers a mix of social health services, social activities and social support in addition to health services and is typically a client/professional relationship approach where the client has choice/autonomy and is assisted with instrumental activities of daily living (Chappell et al., 1986; Weeks, 2002). A medical model of care focuses on the

physician/nursing/passive recipient relationship and involves the assessment and medical treatment of clients, as well as rehabilitation (Baumgarten, Lebel, Laprise, Leclerc, & Quinn, 2002).

A more in-depth review and assessment of the mixed/social/multipurpose model of ADPs are considered, as this model is most common in Canada; however, non-Canadian resources will be considered, as there is not an extensive amount of research on Canadian ADPs.

The funding and administrative systems of ADPs vary across the provinces and result in differences in the way they are organized and the populations they serve (Keefe, Fancey, & Hattie, 2007; Savard, Leduc, Lebel, Beland, & Bergman, 2009). Most researchers suggest that the social and/or mixed/multipurpose models of care may result in improvement in psychosocial measures, such as life satisfaction, behavioural issues, quality of interpersonal relationships, and level of social activities and social integration, among participants (Baumgarten et al., 2002; Capitman, 1982; Chappell & Penning, 1996; Gaugler et al., 2003; Gitlin, Reever, Dennis, Mathieu, & Hauk, 2006; Jarrott, Zarit, Berg, & Johansson, 1998; McCann et al., 2005; Schacke & Zank, 2006).

In Canada, one of the first known Canadian ADPs opened in 1959 in Toronto, Ontario. ADPs began to emerge in the 1970s and 1980s as components of continuing care services provided in long term care facilities and as stand-alone community services for the elderly (Hollander & Chappell, 2001; Weeks, 2002). In Manitoba, funding of the provincial-wide ADPs began in fiscal year 1979-1980, and 17 programs existed by 1980 (Weeks, 2002). In Alberta, ADPs have operated for almost 33 years. In British Columbia, ADPs became a government-funded program in 1979 (Weeks, 2002).

**Nova Scotia.**

In Nova Scotia, ADPs began to see a growth in the 1990s and there has been a slight increase of ADPs throughout the province in recent years due to government initiatives to expand respite and community-based services in the province to meet the needs of the elderly population (Leahey & Lynch, 2010; Nova Scotia Department of Health and Wellness, 2008). Each month, 700 Nova Scotians turn sixty-five; Nova Scotia has the highest percentage of seniors, 16.5% in 2011, in all of Canada and the percentage of seniors is predicted to almost double by 2036 (Nova Scotia Department of Seniors, 2005; Statistics Canada, 2011). Health services for Nova Scotians are mostly delivered through nine district health authorities. These health authorities are responsible for hospitals, long-term care, community health services, mental health services, home care and public health programs in their districts (Nova Scotia Department of Health and Wellness, 2012).

In 2006, the Department of Health and Wellness's' Continuing Care Strategy (CCS), a 10-year plan, was released. The CCS aims to offer respite services and community-based services that meet the needs of the aging population and their caregivers. The province budgeted \$2-million to help set up or expand ADPs across Nova Scotia. This initiative was not meant to replace existing programs, but to build on successes and expand to other communities. To meet the immediate needs, the Department of Health and Wellness partnered with the District Health Authorities to implement ADPs in many areas across the province (Nova Scotia Department of Health and Wellness, 2008). However, there is little accessible information/ assessment or research available on ADPs in the province of Nova Scotia.

*Eligibility for adult day programs in Nova Scotia.* ADPs in Nova Scotia are offered privately and publicly. Publicly they are available through a continuing care model of single-entry access and the nine District Health Authorities. The single point of entry model is the starting point to access subsidized home care and community-based services, long-term care services and adult protection services. “At a policy level, a single administration maximizes the probability that policy issues are viewed in the context of the total continuing care system and not just in one sector such as the residential or community sector” (Hollander & Chappell, 2002, p. 26). A single point of entry system helps to determine whether clients can be treated with less costly home and community-based services, such as ADPs, or should be admitted to long-term care. “Although a case manager refers clients to these community services or provides options from which to choose, it is often up to the client—or more often the caregiver—to seek out these services and make arrangements themselves” (Health Care Council of Canada, 2012, p. 22).

*Expenditures/ user fees.* In Nova Scotia, the Department of Health and Wellness, through the District Health Authorities, provides interim funding to certain publicly funded ADPs in the province. All of the ADPs require an out-of-pocket co-payment by the recipient, which varies considerably depending on whether or not the program receives funding or is run privately and also depends upon whether or not the participant attends a half day or a full day program; prices range from \$0.50 to \$30 (Babbin, D.; Hutchison, F.; Lynch, B.; Smith, C. S., personal communication, January 24<sup>th</sup>, 2012).

### **Service utilization.**

The Canadian and non-Canadian literature suggests that the presence of a spousal

caregiver, higher caregiver subjective burden (Baumgarten et al., 2002); higher activities of daily living needs (Baumgarten et al., 2002); and presence of cognitive deficits (Baumgarten et al., 2002; Markle-Reid et al., 2008; Montgomery, Marquis, Schaefer, & Kosloski, 2002) are associated with higher use of ADPs. The findings underscore the need to carefully target caregivers prior to the late stages of caregiving in order to better support caregivers in their caregiving roles, and thereby reduce caregiver burden and enabling for the care recipient to stay in their home longer.

Canadian studies by Baumgarten et al. (2002), Forbes et al. (2008), Ritchie (2003), and Savard et al. (2009) were consistent in their findings in that the presence of cognitive impairments was found to interact with caregiver burden in predicting ADP use. A finding that is consistent across research studies is that caregivers of persons with dementia tend to utilize support services late in their caregiving careers. Research has shown that many families and caregivers who are aware of the available services, and who would benefit from them the most, fail to use them (Dupuis, Epp, & Smale, 2004; Lawton, Brody & Saperstein, 1991; Montgomery et al. 2002). Lack of awareness, public education and understanding of dementia has lead to stigmatization and barriers to care greatly impacting caregivers physically, psychologically and economically (WHO, 2012).

Predictive measures of use of community resources among caregivers of persons with dementia have typically been based on three main factors derived from the Anderson and Newman (1973) Behavioural Model of Health Service Use for Health Services Utilization, these factors are *Predisposing Factors*, *Enabling Factors* and *Need Factors*. Predisposing factors are the socio-cultural characteristics of individuals that exist prior to their illness such as occupation, ethnicity and attitudes. Enabling factors are

the logistical aspects of obtaining care, the means and how to access health services such as income, travel, and social support. Need factors are the most immediate cause of health service use, from functional and health problems that generate the need for health care services (Anderson & Newman, 1973). Studies using these measures to understand ADP utilization, have neglected the examination of environmental design as a potential predictive factor in utilization patterns. Environmental design, as will be discussed shortly, plays an important role in therapeutic outcomes for persons with dementia and could be a significant factor in service use/ non-use.

Dabelko (2005) looked at short stays versus long stays in ADPs and looked at programmatic variables as a determining factor. These variables included such things as aspects of service delivery, size of program space, type of clientele served and utilization patterns. None of the programmatic variables examined were found to be significant in predicting utilization patterns. However, environmental design features such as lighting, amount of visual stimulus, environmental cues, access to the outdoors, etc. were absent from the research assessment, presenting a noticeable gap.

### **Effective outcomes.**

*Sustaining the caring relationship.* While many caregivers find caregiving rewarding and manage to cope with the stress on their own, it is often at the expense of their own health and well being (Black et al., 2010; Cox, 1997). Recently the Canadian Institute of Health Information found that “caregivers of patients with dementia provide 75% more care than other caregivers and experience nearly 20% higher levels of stress” (Health Care Council of Canada, 2012, p. 31). The demands on the caregiver tend to

increase as the disease progresses due to cognitive impairment being strongly related to behaviour problems.

Researchers have found that caregivers who enrolled a relative with dementia into an ADP had significantly lower care-related stressors and lower feelings of depression and anger after 3 months, compared with a control group not using an ADP (Biegel et al., 1993; Schulz, Boerner, Shear, Zhang, & Gitlin, 2006; Zarit, Stephens, Townsend, & Greene, 1998). Caregivers reported benefits such as improved self-efficacy, improved self-confidence, and enhanced psychological well being (Baumgarten et al., 2002; Gitlin et al., 2006; Warren, Kerr, Smith, Godkin, & Schalm, 2003). In addition to the beneficial outcomes for caregivers, persons with dementia who attend ADPs have been reported to have fewer night time sleep related problems, improvements in moods, decreases in overall agitation and stabilization or improvements in cognitive status (Femia, Zarit, Stephens, & Greene, 2007; Gaugler, Kane, Kane, & Newcomer, 2005a; Schacke & Zank, 2006).

Nevertheless, findings regarding functional outcomes of ADPs for persons with dementia are inconclusive for a variety of reasons and one key issue is various methodological problems resulting in low levels of statistical significance, making it difficult for policy makers to draw definitive conclusions. Consequently, there is a great need for larger comprehensive studies to generate quality empirical data on the effects of ADPs on the dementia population's well being in order to determine the role of such community-based supports in the continuing care sector.

*Delay institutionalization.* There have been conflicting outcomes in the literature suggesting that ADPs delay institutionalization (Capitman, 1982; Harder, Gornick, &

Burt, 1986; Weissert, Wan, Livieratos, & Katz, 1980), as well as findings in the literature suggesting that ADPs are potentially a stepping stone towards institutionalization, due to caregivers utilizing services late in their caregiving careers (Gaugler, 1999; Gaugler, Kane, Kane, & Newcomer, 2005a). Though the extent to which ADPs delay institutionalization has not yet been irrefutably proven, caregivers of persons with dementia have higher caregiver burden than non-dementia caregivers, which has been significantly associated with institutionalization (Dabelko, 2004; Hebert et al., 2001).

Therefore, environments that support the reduced competencies of persons with dementia can be a therapeutic resource to reduce behavioural disturbances and promote the well being and functionality of persons with dementia, inadvertently reducing caregiver burden and potentially delaying institutionalization (Day et al., 2000). “For people with dementia the physical environment can help them achieve their full potential and avoid causing any unnecessary disability” (Davis et al., 2009). Community-based research has focused on a plethora of recipient and caregiver variables in order to provide evidence of service utilization and possible outcomes, yet environmental design remains neglected.

In 2003, a Health Care in Canada survey revealed that 35% of the respondents reported having dissatisfaction with access to Canadian home and community care services (Government of Canada, 2003). In the survey, a large proportion (43%) of Canadian respondents with dementia rated the availability of healthcare services in the community as fair to poor and 27% rated the quality of healthcare services in the community as fair to poor (Government of Canada, 2003). Home and community care is still a very small component of the health system accounting for two to seven percent of

total provincial or territorial health care expenditures (Forbes, Morgan, & Janzen, 2006). As the population ages, the highest quality approach to care must equally support the continuum of care, and make the shift from costly acute and long-term care to quality, efficient and effective home and community-based care.

In order to maximize the quality of care provided in community-based services it is critical that the design of the physical environment be examined. A dementia-friendly environment can be defined as a system of support that best provides assistance for the person to remain engaged in everyday life in a meaningful way to improve quality of life (Brawley, 1997; Cutler, Kane, Degenholtz, Miller, & Grant, 2006; Davis et al., 2009; Lawton & Nahemow, 1973).

### **Physical Environment Design**

#### **Quality dementia care.**

Person-centred dementia care (PCC) is an important aspect in understanding quality care for persons with dementia. The aim of good dementia care is “to maintain personhood in the face of the failing of mental powers” (Kitwood, 1997, p. 20). There is a focus on maintaining, supporting, stimulating and/or restoring the independence of the person living with dementia (Alzheimer Society of Canada, 2011). The importance of the design of an environment has supported the person-centred care approach in improving quality of life for people with dementia (Davis et al., 2009; Geboy, 2009; Kane et al., 2003). The design of an environment can promote well being and functionality for people with dementia by capitalizing on particular strengths and compensating for cognitive deficits resulting in feelings of independence, autonomy and control (Day et al., 2000; Lawton & Nahemow, 1973). Despite efforts to move dementia

care away from the medical model to a more dementia-friendly, person-centred care model, the dominance of a cognitively-able environmental design still impedes dementia care services (Davis et al., 2009). An environment that is traditionally designed for cognitively-able individuals places stress on the cognitive abilities of those with dementia, resulting in poor outcomes and poor quality of care (Day et al., 2000; Lawton, 2001; Ziesel et al., 2003). For example, large, open spaces, such as community centres or gymnasiums, tend to encourage large group activities, in terms of visual and auditory acuity, these large groups are likely to place individuals with dementia beyond the distance of their reasonably expected abilities impacting their social confidence and personal value often preventing participation in activities and resulting in a person with dementia to withdraw socially (Alzheimer Society of Canada, 2011; Western Australia Department of Health, 2007). A familiar and home-like environment allows persons with dementia to better cope with their surroundings by improving their orientation and sense of safety and security resulting in personal validation and a sense of control (Murray, 2001). Day and colleagues (2000) found in their literature review on the therapeutic design of environments for people with dementia that in non-institutional environments persons with dementia are less aggressive, preserve better motor functions, require lower usage of tranquilizing drugs, and have less anxiety, all of which are positive quality of life outcomes.

### **Design principles.**

A “quality” dementia environment has certain physical design features that support the person-centred philosophy by supporting the adaptation level of persons with lower competency levels resulting in positive affect and adaptive behaviours ultimately

impacting their quality of life (Alzheimer Society of Canada, 2011; Brawley, 1997; Lawton, Fulcomer, & Kleban, 1984). Cohen and Weisman (1991) identified nine design principles as essential to meeting and supporting the needs of individuals with dementia: 1. Ensure safety and security, 2. Support functional ability through meaningful activity, 3. Heighten awareness and orientation, 4. Provide appropriate environmental stimulation and challenge, 5. Develop a positive social milieu, 6. Maximize autonomy and control, 7. Adapt to changing needs, 8. Establish links to the healthy and familiar, and 9. Protect the need for privacy.

In the literature, these design principles have been applied to assess the quality of the physical environment of acute care and long-term care facilities in order to understand how the environment is maintaining, supporting and restoring the independence of the person living with dementia (Cutler et al., 2006; Fleming and Forbes, 2009; Lawton et al., 2000; Moos & Lemke, 1984; Ziesel et al., 1994; Ziesel et al., 2003).

A thorough review of the literature revealed a dearth of information on assessing ADP physical environments for persons with dementia. Problem behaviours and caregiver and client variables continue to dominate the ADP literature. In 2005, an ADP report was published in a nursing home magazine, indicating that facility limitations were one of five most significant problems in meeting the needs of the clientele with dementia (Spinks, 2005). Size of facility space was reported as posing several problems, space not being available for a participant who needed privacy or isolation during the day. Activities were limited to group activities, which are not always effective for people with dementia. In order to use the toilet, participants had to be taken by the program aides from the room and escorted across a dining room and lobby used by more active,

independent seniors. Because the day care room was adjacent to areas for independent seniors, participants had to be monitored closely so they would not wander from the building and get lost. Located in the inner city, the program owned no outdoor space, which severely limited opportunities for participants to spend time outdoors (Spinks, 2005).

The little information that is available on ADP environment design indicates that, “the current state of the design of most day care facilities is impoverished and lacks responsiveness to the needs of the populations they serve” (Western Australia Department of Health, 2007, p.18). The potential of environmental design to improve the lives of persons with dementia and their caregivers has not yet been fully appreciated (Day et al., 2000).

Assessment tools have been developed to quantifiably measure the quality of an environment to support persons with dementia based on various ratings of the nine design principles, each of which represent a desired outcome of a “quality” dementia care environment (Cutler et al., 2006; Day et al., 2000; Fleming, 2009). These assessment tools will be discussed below, but first it must be mentioned that there are no comprehensive measures of these principles, such as those for institutional settings, for ADP environments. Key environmental features of quality dementia environments derived from institutional-based research require further elaboration and careful application to ADPs.

#### **Adult day program design guidelines.**

In an extensive study undertaken by the University of Sydney, Australia, at the request of the Australian New South Wales Department of Aging, Disability and Home

Care, a set of guidelines for developing a day care centre for dementia was developed (Hodges et al., 2006). Around the same time in the United States, Diaz Moore, Geboy, and Weisman (2006) completed a study to offer guidance on how to better design and plan a good-quality ADP. These two studies, to my knowledge, are the only ones that look at the design of the ADP physical environment for persons with dementia by offering hypothetical guidelines based on the literature of environmental design for persons with dementia.

The nine issues that emerged from their extensive literature reviews of physical environment design discussed “general environmental concepts that are important to implement in dementia day care centre environments to maximize its therapeutic capabilities” (Bridge & Hodges, 2007, p. 4). Both the Hodges et al. (2006) and Diaz Moore et al. (2006) design guidelines closely follow the principles outlined by Cohen and Weisman (1991) that have been used for the development of institutional-based environmental assessment tools. The uniqueness of the 2006 approaches is that their guidelines focus on issues most crucial to environments for people with dementia in ADPs (Diaz Moore et al., 2006; Hodges et al., 2006). For the purposes of this study, the Hodges et al (2006) guidelines will be discussed, as they focus only on the physical environment design for dementia.

The following are the nine guidelines:

***1. Afford independence, autonomy & control by being adaptable to the users***

Environments that offer choice and enhance confidence and reinforce personal identity and feelings of autonomy are more likely to be meaningful to more clients (Calkins, 2004). “For example, this includes having more than one activity

room to provide the choice of sitting in a quiet room or participating in more demanding activities such as singing” (Hodges et al., 2006, p. 12).

**2. *Spaces that afford meaningful & culturally appropriate activity***

Every person with dementia, until perhaps in the late stages of the disease, has certain capabilities. It is important for quality person-centred care environments to support those abilities and engage the individual in meaningful activities (Flemings, Forbes & Bennett, 2003; Ziesel et al., 2003). Frequent and easy engagement in meaningful activities will enhance the well being of people with dementia (Cunningham, 2008, Diaz Moore et al., 2006).

**3. *Interior and exterior detailing that is familiar & non-threatening***

Furnishings and décor should reflect the era that the clients attending recall rather than the present time. A familiar setting and a non-threatening environment, such as curtains in the windows rather than blinds, carpet rather than tile, are important features in creating a more home-like setting and reducing stress, agitation and confusion (Day et al., 2000; Diaz Moore et al., 2006; Fleming et al, 2003).

**4. *Spaces, access points, pathways & services that use appropriate modes (light, colour, pictorial, verbal, tactile) for presentation of essential information to assist appropriate task completion (i.e. cueing stimuli)***

An unpredictable environment for an individual with dementia is both challenging and unnecessarily confusing. Sufficient cues and clear pathways, for example, can help insure that bathrooms are located in time. Access to the outside and windows to view the outside environment help with orientation to time and season (Brawley, 1997). “The space must be safe for the person with dementia, without

feeling like a prison. The principles of appropriately contrasting colours apply to outdoor spaces as well as interiors” (Cunningham, 2008, p. 4). Appropriate lighting allows for visibility and reduces the demands of the environments by helping those individuals with vision loss.

**5. *Spaces, access points, pathways & services that eliminate unnecessary complexity & reduce extraneous sensory stimuli***

People with dementia require environments that provide stimulation and cues to help them function at their optimum level of competencies (Brawley, 1997; Calkins, 2002). People with dementia tend to have memory loss, disorientation, sensory loss, and loss of ability to interpret what they see, hear, feel, taste and touch (Calkins, 2004). Sensory overstimulation and sensory deprivation is a consistent problem in many dementia care environments and can lead to boredom, anxiety, depression, confusion and agitation (Cohen & Weisman, 1991; Kitwood, 1997).

**6. *Spaces, access points, pathways & services that reduce agitation & opportunities for meaningless wandering***

Reduction in environmental disorientation can occur when a simple layout and good visual cues are present reducing negative behavioural symptoms (Hodges et al., 2006). Well-designed entrances, such as camouflaged doorways, and way-finding techniques can allow a person with dementia to function at their optimum level (Cunningham, 2008).

**7. *Spaces, access points, pathways & services that afford approach, reach, manipulation, and use regardless of user's limitations (i.e. highly negotiable)***

The environment supports the individuals experience and must encourage the highest level of functioning regardless of the users limitations (Brawley, 1997).

An environment that is simple and does not require the participant to remember where places are will help them too more easily function. For example, ensuring that the toilets are directly visible through large cueing signs (Diaz Moore et al., 2006; Fleming et al., 2003).

**8. *Spaces, access points, pathways & services that are tolerant of user related error (i.e. safe & secure)***

Safety features such as hidden locks on doors, camouflaged exit doors, contrast coloured grab rails, hot water controls and slip-resistant floors are features that assist in the safety of the person with dementia (Alzheimer Society of Canada, 2011; Brawley, 1997; Fleming, 2009).

**9. *Spaces, access points, pathways and services that meet the needs of staff***

Lyman, Pynoos and Cohen (1993) found that the “environmental press” model also applies to staff of dementia day care centres as it does for those with cognitive impairment. (as cited in Hodges et al., 2006). Reducing difficult behaviours for persons with dementia ultimately reduces stressful situations for staff.

Hodges et al., (2006) assert that these nine dementia guidelines for ADPs “appear to impact the effectiveness of the environment as a therapeutic resource” (p. 22).

However, further empirical research is needed to operationalize these guidelines and assess the key environmental features that represent a desired outcome of a “quality” person-centred dementia care environment. To create comprehensive measures of the

ADP physical environment an examination of institutional-based assessment tools and their scales is needed to help further elaborate their application to measuring the ability of the ADP physical environment to support the needs of persons with dementia in relation to the ADP design guidelines.

**Environmental measurement.**

Fleming (2011) stated that:

Understanding good environments and their relationship to good outcomes for people with dementia is only possible by use of measurement instruments that provide an indication of the quality of the environments, allow comparison of one environment with another and enables weaknesses in the environment to be identified in order to describe changes that can be made in the environment in attempt to make them more suitable for people with dementia (p. 108).

There have been multiple environmental assessment tools designed over the years to measure and assess the quality of the physical environment in residential facilities for people with dementia as well as special care units (SCU); the tools vary in how they define and measure the nine design principles (See Table 1 and Table 2 for more detail).

The Multiphasic Environmental Assessment Procedure (MEAP) (Moos & Lemke, 1984) is most well known and is a very detailed assessment tool that provides a very broad definition of environment. The MEAP has five parts: Physical and Architectural Features Checklist (PAF), Policy and Program Information Form (POLIF), Resident and Staff Information Form (RESIF), Sheltered Care Environment Scale (SCES) - Form R and the Rating Scale (RS). It tends to be biased towards large institutional settings, is extremely long and does not address some of the important aspects of dementia care

(Fleming, Crookes, & Sum, 2008; Cutler et al., 2006), therefore was not used for this study.

The Therapeutic Environment Screening Scale Nursing Survey (TESS –NH) (Sloane et al., 2002) is a highly used tool and “has become the gold standard for assessment of environments for people with dementia” (Fleming, 2011, p. 108). The TESS-NH includes program information in addition to physical environment features and is often used to check the criterion of other scales (Lawton et al., 2000; Sloane et al., 2002). It is specifically designed for dementia special care units and does not enable a simple summary of the quality of the environment, Flemings, (2011), describes it as “less than comprehensive with only 50% of the scale having any relevance to the physical environment” (p. 109). The scale uses a single item global rating scale and a Special Care Unit Environmental Quality Scale (SCUEQS). The single item global rating scale is used to make a judgment about the quality of the environment for the care of persons with dementia and the SCUEQS ensures that equal weight is given to a comprehensible number of defined items. The TESS-NH is biased towards an institutional setting and 50% of the SCUEQS is “of dubious relevance to the specific care of people with dementia” (Fleming, 2009, p. 7), and was consequently not relevant for this study.

The Professional Environmental Assessment Protocol (PEAP) (Norris-Baker, Weisman, Lawton, Sloane, & Kaup, 1999) is specific to dementia special care units and does not specifically assess the physical environment due to the inclusion of programs, practices and spirituality (Cutler et al., 2006). Many items were evoked from the PEAP in the design of the Adult Day Centre Environmental Design Assessment (ADC EA) (Diaz

Moore et al., 2006); much like the PEAP, the ADC EA is lengthy and assesses programs, practices and spirituality.

The Dementia Audit Tool developed by Colm Cunningham (2008) (DAT) is detailed and is “intended to provide a rich source of ideas for improvement where improvement is necessary” (Fleming, 2009, p. 23). The sections are organized by locations such as bedroom, living room and dining area. Due to limited access to this audit tool, the Environmental Audit Tool (EAT) developed by Fleming and Forbes (2009) will be examined in more detail instead. The EAT and the DAT were developed on similar philosophies (Fleming, 2009). The EAT’s philosophy is to capture more small scale, person-centred environments making it a suitable tool to apply to ADPs. The majority of questions are answered “*yes*” or “*no*”, making the tool relatively quick and easy to use when compared to the TESS-NH and the DAT (Fleming, 2009). Fleming’s (2009) study looked at 22 dementia specific units and 8 units accommodating people with a variety of diagnoses. The EAT item by item was found to compare favourably with the TESS-NH and had better levels of internal consistency, higher inter-rater reliability and a strong correlation with the TESS-NH (see Table 1 and Table 2 for more details).

Table 1: *Psychometric Properties of Environmental Assessment Tools*<sup>1</sup>

	<b>Assessment Tools</b>					
	<b>MEAP</b> (PAF CHECKLIST)	<b>TESS-NH</b>	<b>SCUEQS</b>	<b>PEAP</b>	<b>EAT</b>	<b>DAT</b>
Inter-rater reliability		0.93*	0.84*		0.97*	0.95*
Intra-class correlation coefficient of the items in excess of 0.7		39.8%*			54.2%*	28.8%*
Instances of Negative correlations		3*			1*	9*
# of scales that meet Cronbach's alpha 0.6 or higher		7*			6*	8*
# of scales	8	13 (+1 Global Rating Scale)	13	9	10	13
# of items	153	84	18		72	194
Time to Complete		20-30 min		45-90min	20-30min	45-60min
Ease of Use	*Difficult	*Moderate		*Difficult	*Moderate	

<sup>1</sup> Scores from the study done by Fleming, R. (2009) in The use of environmental assessment tools for the evaluation of Australian residential facilities for people with dementia; Australian government initiative (Dementia Collaborative Research Centre Report).

Table 2: Comparison of Design Principles in Six Environmental Assessment Tools<sup>2</sup>

Design Principles	Principles in ADPPEAT	MEAP (PAF CHECKLIST)	TESS-NH	SCUEQS	PEAP	EAT	DAT
Ensure safety and security	◇	◇	◇	◇	◇	◇	◇
Support functional ability through meaningful activity	◇	◇	<b>X</b>	<b>X</b>	◇	◇	◇
Heighten awareness and orientation	◇	◇	◇	◇	◇	◇	◇
Provide appropriate environmental stimulation and challenge.	◇	<b>X</b>	◇	◇	◇	◇	◇
Develop a positive social milieu	◇	◇	◇	<b>X</b>	◇	◇	◇
Maximize autonomy and control	◇	◇	◇	<b>X</b>	◇	◇	◇
Adapt to changing needs	◇	◇	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Establish links to the healthy and familiar	◇	<b>X</b>	◇	◇	◇	◇	◇
Protect the need for privacy	◇	<b>X</b>	◇	<b>X</b>	◇	◇	◇
Provide for planned wandering	◇	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	◇	◇
Access to Outside	◇	<b>X</b>	◇	<b>X</b>	<b>X</b>	◇	◇
Be small	<b>Contextual Information</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	◇	<b>X</b>
Maintenance	<b>X</b>	<b>X</b>	◇	◇	<b>X</b>	<b>X</b>	<b>X</b>
Cleanliness	<b>X</b>	<b>X</b>	◇	◇	<b>X</b>	<b>X</b>	<b>X</b>
Staff Facilities	◇	◇	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

<sup>2</sup> ◇ = Yes, the tool has the design principle.**X** = No, the tool does not have the design principle.

*Rationale for environmental assessment tool.* The EAT was useful for this study as it was relatively quick to complete (20-30min) and required minimal training. The EAT provided a valid and comprehensive tool for quantitatively describing and measuring the physical features in environments that care for persons with dementia.

The EAT's 10 design principles were similar to the 9 design guidelines mentioned in Hodges et al. (2006) and the 11 design guidelines mentioned in Diaz Moore et al. (2006) for ADPs. In order to facilitate an accurate description of ADPs, the EAT was used in collaboration with the Hodges et al. (2006) and Diaz Moore et al. (2006) guidelines to create an assessment tool that measures the presence or absence of key discrete environmental design features that exemplify the 9 design principles found to be critical for supporting the needs of persons with dementia (see Appendix A. ADPPEAT).

Many of the items listed in the Hodges et al. (2006) and Diaz Moore et al. (2006) guidelines were found to be comparable with items in the EAT's 72 discrete environmental measures. The developed Adult Day Program Physical Environment Assessment Tool (ADPPEAT) reflects the organization of the EAT and uses many of the EAT's measures because it was found to be quick, easy to use, "valid and reliable" (Fleming, 2009, p.24).

2012 marks the seventh-year of the ten-year continuing care strategy in Nova Scotia, it is timely to assess the province's ADP environments in order to help stakeholders understand what these services look like, what they offer and whether or not they are supporting the needs of the aging population.

## **Methodology**

### **Research approach.**

In order to gain a deeper understanding of the extent to which ADP environments in Nova Scotia implement key environmental design principles, existing environmental measures for long term care environmental design features were modified to address ADPs and tested for their robustness. Next an assessment of ADPs in Nova Scotia was completed using the developed tool in a cross-sectional design. Two research objectives were imbedded in this approach:

*Objective 1.* To test the reliability and validity of the developed Adult Day Program Physical Environment Assessment Tool (ADPPEAT).

*Objective 2.* To assess the extent to which different types of ADP environments in Nova Scotia implement the key physical environment design principles, which are critical to supporting the needs of persons with dementia.

### **Sample.**

An ADP was defined as a community-care group program designed to meet the needs of functionally/non-functionally impaired adults with some level of cognitive impairment by means of a comprehensive program that provides a variety of health, social, and related support services in a structured setting. In order to participate in the study the ADP had to be willing to accept clients at early and/or late stages of dementia. The sampling frame included all known ADPs in the province of Nova Scotia (N=27). A list of ADPs was generated by merging various resources indicating the location of these ADPs; these resources included personal communications with VON, a list from the Department of Health and Wellness, information from the Caregivers of Nova Scotia

website and a list in the Positive Aging Directory (2011). From this list a total of 35 ADPs were contacted, 8 of which were no longer operational. Seven of the eight ADPs found to be no longer operational had closed down due to lack of funding and limited resources and the eighth shut down its program operating out of a church, re-named itself and moved into a new building that was provided for the ADP, this new site was included in the final 27. Eighteen of the ADPs were supported with District Health Authorities (DHA) and/or Department of Health and Wellness funding as part of the Nova Scotia Continuing Care Strategy (CCS). Most of the ADPs were located in a community centre (10) or a nursing home (9), operated out of spaces of less than 800 square feet (16), had a mix of dementia as well as non-dementia clientele (22), and had less than 16 people attending the program (22). The majority of ADPs operated less than 3 days per week (18) with the largest proportion operating 1 day a week (11); most of the programs operated 6-8 hours a day (20) at a fee of \$30 or less for the user. Additionally, all of the ADPs offered activities for services, such as crafts, bingo, and social outings (see Table 5 Descriptive Features of Nova Scotia's Adult Day Programs (N=27)).

#### **Research instrument.**

The ADPPEAT comprises eight of the 10 EAT principles, which were slightly revised to better describe an ADP environment (Fleming & Forbes, 2009). Under these 8 principles 42 of the EAT's 72 items were used. The items chosen from the EAT were found, from the literature review, to be applicable to ADP environmental design features. Two of the EAT principles were not included in the ADPPEAT; these were "size" which was a one item principle and has been captured by the descriptive information collected

and “community links” which was not relevant to this study as its items implied an institutional setting (see Figure 2. for organization of variables).

Additionally, 11 items from the ADP environmental checklist in the Dementia Design Guidelines developed by Hodges et al., (2006), and 14 items from the Adult Day Centre Environmental Assessment (ADC EA) Diaz Moore et al., (2006) were used to capture the 8 principles. These items were items that were not captured by the EAT tool and were found to be “necessary for providing quality dementia capable adult day care” (Diaz Moore et al., 2006, p. 174; Hodges et al., 2006; Western Australia Department of Health, 2007). An additional principle not found in the EAT was taken from Hodges et al. (2006) Dementia Design Guidelines, this principle was “Spaces for staff” and included an additional 5 items which were added to the ADPPEAT. A total of 72 items (indicator/observed variables), not including the categorical variables being collected to categorize the ADPs, were selected to measure the presence or absence of the key physical environment design principles (latent constructs/ unobserved variables) in the ADPPEAT (Appendix A.).

### **Research measures.**

Each principle is considered to be a sub-scale. The sub-scale score indicates how supportive an environment is for persons with dementia. The items in the ADPPEAT are scored dichotomously, (*yes*=1 and *no*=0) items. If the item is not available, coordinators label the item as *no*, if the item is available, coordinators label the items as *yes*, and when appropriate if the item being asked about is potentially not applicable, coordinators label the item as *N/A*. The number of *yes* answers in each sub-scale constitutes the score for that sub-scale, with all other answers equalling 0, with the exception of three sub-scales.

For sub-scale “Spaces that reduce unwanted stimulation”, the number of *no* answers constitute the score, for sub-scale “Spaces that are familiar”, items are labelled as “many”, “a few”, or “none”, where the number of “none” answers constitute the score and for sub-scale “Spaces that afford, autonomy, independence and control”, two of the 7 items address room counts and are labelled as “none”, “1”, and “2 or more”, where “2 or more” answers constitute the score. All items on a subscale are weighted equally.

A score for each of the nine sub-scales is calculated out of 10 by dividing the achieved total score by the possible score and multiplying by 10. This was done to compare the ADPs by the scores obtained on each of the ADPPEAT sub-scales and to handle the problem of *N/A* (not applicable) items and missing data which were coded as user-missing values and system-missing values as missing values in the analyses. An overall ADPPEAT summary score was not computed because of differences in the number of items in each the sub-scale.

The following item is drawn from the sub-scale: “Spaces that afford autonomy, independence and control” as an example.

Does the dining area provide opportunities for participants to eat in small groups (2-4)?	N/A	NO Score 0	YES Score 1	Score
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Descriptive information was collected in order to categorize and compare the various ADPs, including: District Health Authority as 1) South Shore; 2) South Shore - South West; 3) Annapolis Valley; 4) Colchester East Hants; 5) Cumberland; 6) Pictou County; 7) Guysborough; 8) Cape Breton; 9) Capital Health. Number of clientele per day was categorized as 1) 10 or less; 2) 11-16; 3) 17-29; and 4) 30+. Type of clientele served was categorized as 1) dementia only; 2) mixed between dementia and non-dementia; or

3) mostly non-dementia. Building type was categorized as 1) community centre; 2) church; 3) private residence; 4) nursing home/hospital. To adjust for small sample size in the private residence category and capture the differences between community-based and institutional-based buildings, the variables were re-coded into 1) community-based (community centre/church/private residence); and 2) institutional-based (nursing home/hospital). Number of days open per week was categorized as 1) 1 day per week; 2) 2-3 days per week; 3) 4+ days per week. Hours of operation per day was categorized as 1) 0-2; 2) 3-5; 3) 6-8; 4) 9+. User fees for a full day and half day were each categorized as 1) \$0-\$15; 2) \$16-\$30; and 3) \$31+. Programs supported with DHA/DHW funding were categorized as 1) Yes funding from DHA and/or DHW; or 2) No funding from DHA and/or DHW. Program support was categorized as 1) Stand alone; or 2) Part of a larger network. Number of years of operation was categorized as 1) 0-2 years 2) 3-4 years; 3) 5-6 years; 4) 7+ years. Size of the program space was categorized by square feet as 1) 0-800; 2) 801-1600; 3) 1601+. Type of services offered was categorized as 1) Nursing/Medical Services; 2) Therapeutic Services; 3) Activities; 4) Other. To capture the different combinations of services offered, the variables were re-coded into 1) Activities only; 2) Activities and Nursing/Medical Services; 3) Activities and Therapeutic Services; 4) Activities, Nursing/Medical and Therapeutic Activities. Figure 2 outlines the principles (sub-scales), their count of items and the categorical variables used for analysis.

**Components of the Adult Day Program Physical Environment Assessment Tool**

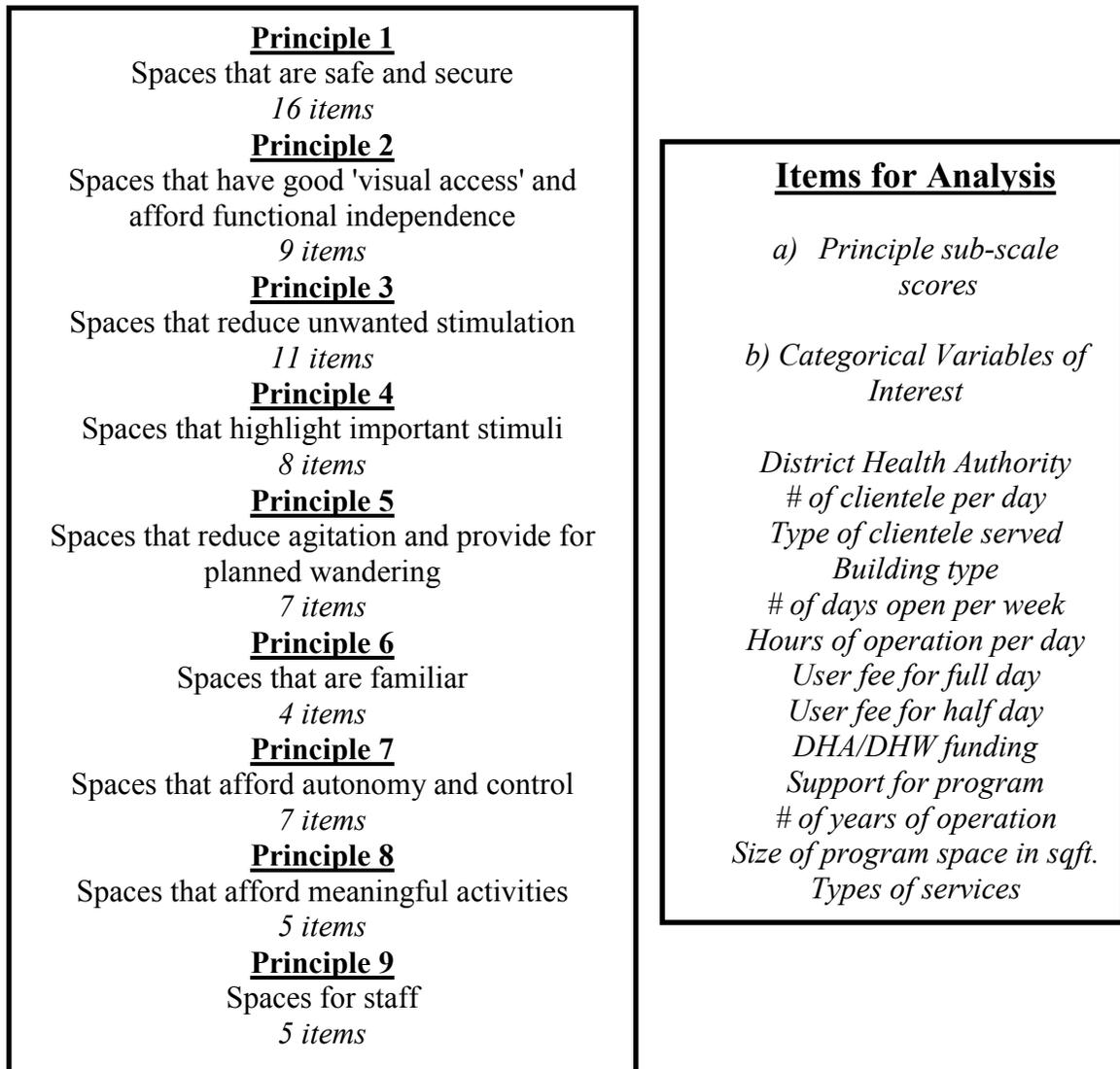


Figure 2. Organization of Variables.

**Procedure.**

Following ethics approval, four ADPs, were selected to pre-test the tool, one was in a nursing home setting, one in a hospital setting, one in a private residence and one in a community centre setting. These ADPs were contacted by telephone, were introduced to the study and were asked if they would like to participate in pre-testing the ADPPEAT. Pre-testing was done to test for clarity of language, flow of questions, and time to complete the tool. The length of time to complete the ADPPEAT online was approximately 15-30 minutes. Pre-testing the tool in different building types was to give a greater understanding of how the tool was understood in different environments.

From pre-testing, no changes to the tool resulted except for the expansion of the final question in order to incorporate a greater understanding of the context of the ADP from the perspective of the coordinator. The final question reads: “Are there any physical environment features and/or aspects of your adult day facility that you feel are missing from this assessment tool? If YES, please specify” and “Do you have any other comments?” Data submitted by those participating in the pre-test were included in the final results because the ADPPEAT content did not change. These ADPs were contacted and given the opportunity to answer the expanded question.

After pre-testing, the coordinators of the remaining 23 ADPs were contacted by a recruitment information letter that was sent out by e-mail with a link to the online-tool. If the tool was not completed, a telephone call was placed in order to provide the coordinator with information about the study and to ask if they would like to participate (see Appendix B. Letter of Introduction and Information). This approach was chosen as ADPs vary considerably in days and hours of operation and it was felt that sending out an

e-mail first with the study information and then following up with a phone call would result in greater participant response rate and faster turnaround times. The recruitment letter contained information on the study, risks and safeguards to participating, contact information and a link to the on-line tool. The online tool was created using the Canadian data collection web-based survey software site called Fluid Surveys. The site stores all survey data securely and privately in Canada by using Encryption and Firewall technology. Web based surveys facilitate efficient analysis; as data may be transferred automatically into an electronic spreadsheet or a statistical analysis software program, in this case SPSS.

Those coordinators that wanted to participate in the study could access the tool online or request to be sent an ADPPEAT by their preferred method (e-mail, fax or mail with a postage paid return envelope). All respondents completed the tool online, the length of time to complete the tool ranged between 15-30 minutes for the 27 ADPs. The ADPPEAT included a statement indicating that by completing the tool, the coordinator was agreeing to participate in the study; therefore completion of the tool implied consent.

From the pool of respondents from ADPs in Capital Health District 9 that completed the ADPPEAT, a select sample of 4 ADPs were purposively selected to represent the building types that the ADPs were categorized into for analysis (community-based and nursing home/hospital), in order to crosscheck data. These ADPs were contacted by telephone/e-mail and it was explained to the coordinators that crosschecking data was done for the purposes of validating the reliability of the developed tool by checking to see how similar our responses were. The coordinators were informed that if there were any differences in our scoring of the environment features I

would call them to discuss those differences in more detail. Participation was voluntary and required a tour of the program (15-30 minutes), where I recorded my observations of the ADP physical environment using the ADPPEAT (15-20 minutes). In two of the tours participants were present and utilizing the space. The tours were restricted to Capital Health District 9 because of budgetary constraints. It was felt that crosschecking data in different building types provided the necessary data to calculate the mean percentage of agreement on the item scores amongst different raters in different environments using the ADPPEAT.

### **Analysis.**

The analysis of the data was completed in two stages in order to fulfill the two objectives. In the first objective, the reliability and validity of the ADPPEAT was tested using the IBM Statistical Package for the Social Sciences (SPSS) version 20. The data were entered, recoded, and reviewed for accuracy.

First, non-variant items, that is, items with the same response from all respondents were identified. Following this, the internal-consistency of the ADPPEAT sub-scales were measured to find out how closely related the set of items under each sub-scale were as a group, this was computed by Cronbach's alpha in SPSS. A Cronbach's alpha of 0.6 acceptability level was used, however, 0.7 or higher was strived for in order to show that the items were a good measure of the same construct (principle) (Bland and Altman, 1997; Bryman, Teevan, & Bell, 2009; Miller, Epstein, & Bishop, 1985; Yaffe, 2003).

Following this, confirmatory factor analysis (CFA) with maximum likelihood, using Analysis of Moment Structures (AMOS), an SPSS add-on, was employed to assess the construct validity of the ADPPEAT. Construct validity is important for justifying the

use of a specific measurement tool and documenting the efficiency and precision of the measures (Suhr, 2006). The chi-square test in CFA, the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI)<sup>3</sup> were used to analyze how well the data fit the hypothesized model and adjust for issues with small sample size (Schrieber, Nora, Stage, Barlow, & King, 2006). Maximum likelihood estimation<sup>4</sup> was used rather than pair-wise or list-wise deletions in order to estimate missing response patterns and use all information of the observed data. Furthermore, factor loadings and squared multiple correlations<sup>5</sup> were assessed in order to provide an indication of the reliability of the individual measures. The items in each sub-scale identified by CFA as having poor factor loadings that corresponded to the items identified by Cronbach's alpha as contributing to low internal-consistency scores were deleted; sub-scales were retested to see if the fit of the model and the internal-consistency scores improved.

It must be noted that those items that reflected the theoretical core of the latent construct and did not correlate strongly with it in preliminary analyses, were not simply eliminated without consideration of why they did not behave as expected (Clark & Watson, 1995).

Following this, the inter-rater reliability of the ADPPEAT was tested (Bryman, 2009; Yaffee, 2003). The inter-rater reliability of the ADPPEAT was analyzed by looking at the data collected from the four crosschecked study sites. The coordinator responses to the ADPPEAT in each crosschecked study site were compared to the researcher's

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<sup>3</sup> Criteria: chi square test with a p-value > 0.05, RMSEA < 0.08 and CFI > 0.90 (Hu & Bentler, 1999; Schrieber et al., 2006).

<sup>4</sup> The likelihood is computed for the observed portion of each case's data and then accumulated and maximized.

<sup>5</sup> Squared multiple correlations indicate the items (observed variable) percentage of variance accounted for by the relative latent construct (unobserved variable/ principle) (Albright & Park, 2008; Carmines & Zeller, 1979).

observations in order to calculate a mean percentage of absolute agreement on the item scores (Norris-Baker et al., 1999). Although these calculations are a measure of agreement and provide an idea of how much agreement exists, it does not take into account the agreement that would be expected purely by chance. However, due to the limited sample size of  $N=4$  for the crosschecked data, the Kappa statistic and the Intraclass correlation were not applicable for this study (Jones, Johnson, Butler, & Main, 1983).

The extensive literature review and use of measures from a reliable and valid environmental assessment tool, (EAT), increased the content validity of the developed ADPPEAT tool (Fleming & Forbes, 2009). In addition to carefully selecting the items that comprise the ADPPEAT, content validity was improved by pre-testing the tool with the ADP coordinators. In addition to this, coordinators of ADPs were asked about the face validity of the pre-tested and finalized tool by answering a question on how they would rate the tool out of 10 on capturing the physical environment of an ADP.

After testing the reliability and validity of the tool, identified items were deleted and sub-scale total scores were re-calculated; the data were then analyzed using SPSS for the second research objective. First, descriptive statistics were computed, including frequencies, measures of central tendency, standard deviations and cross-tabs. The descriptive statistics for the ADPPEAT items and the categorical information identified noteworthy variation amongst the ADPs. The categorical information were treated as independent variables and used in computing one-way ANOVA to determine whether the categorical information had significant effects on ADPPEAT sub-scale scores, the dependent variables.

The ADPPEAT sub-scale scores were designed to pinpoint the strengths and weaknesses of an ADP's physical environment in supporting persons with dementia; the higher the score the more supportive the environment is; the calculated sub-scale scores were therefore the most informative variables in indicating how supportive the environment was for persons with dementia.

One of ANOVA's assumptions is that the dependent variable be normally distributed, however due to the extensive variation amongst ADPs it could not be expected that the distribution would look very normal. ANOVA is reasonably robust and the data were checked to make sure that they were basically symmetrical. Tests for the homogeneity of variance were done using the Levene's Test of Homogeneity of Variance in SPSS. The Tukey *post-hoc* test was conducted to show which categories of ADPs differed from each other when significant differences in mean scores occurred. When values were not greater than 0.05 for the Levene's Test, meaning that homogeneity of variance assumption was not met, the Games-Howell test was used, which does not assume population variances are equal or that sample sizes are equal (Gravatter & Wallnau, 2009).

#### **Adult Day Program Coordinator Open Ended Responses.**

The ADPPEAT collected open-ended responses from coordinators. The responses to these questions were not analyzed using a systematic qualitative approach. The questions were used as a method of hearing the voices of the coordinators and having a deeper understanding of the context in which the program was situated. The individual quotes were selected to exemplify the findings being discussed.

**Ethical Considerations.**

The ethical concerns for this study were minimal as the measurement tool assumed a non-intervention approach such that physical environment features were assessed independent of the characteristics of its users. The tool did not incorporate personal appraisals or considerations of subjective meanings or actual frequency or object use.

There was the possibility that some ADP coordinators may have been concerned about the disclosure of ADP information, particularly when a tour of the program was given for crosschecking data. To protect the identity of participants, personal information was not required for this study, and when volunteered, was excluded from the database. The coordinators were assured that all identifying information about their program was to be presented as aggregated data and the thesis supervisor and researcher were the only ones with access to the collected data. Ethics approval was received in May 2012 from the University Research Ethics Board (UREB) of Mount Saint Vincent University (#2011-096) and with a minor revision was resubmitted. Ethics approval was also required from the Research Ethics Board (REB) of the Victoria Order of Nurses (VON) and was received in June 2012 (#05162012-01).

## Results

### Testing reliability and validity.

The goal was to develop an environmental assessment tool that could describe an ADPs physical environment with considerable precision (see Appendix A. for tool).

When the reliability and validity were tested, the general finding was that items would need to be eliminated in order to improve certain sub-scale internal consistency scores and model fit. Items that had zero variance, little variation, poor factor loadings or were found to be non-reflective of an ADP environment were considered for elimination.

First, non-variant items, items that were answered in the same way in all ADPs, were identified; these were smoke detection devices (Saf10), which were present in all ADPs and colour contrasts in flooring (Stim7), which were not present in any of the ADPs (see Table 3).

Second, internal consistency for the 9 sub-scales was tested, only 2 of the 9 sub-scales met the strived for 0.7 alpha reliability coefficient, these were “Spaces that reduce agitation and provide for planned wandering” and “Spaces that afford meaningful activities” (see Table 3). Items contributing to low internal consistency scores in the remaining 7 sub-scales were identified.

Third, CFA was conducted in order to test the reliability of the measures. The CFA standardized factor loadings and squared multiple correlation (SMC) values provided intuitive information about the strength of the loading and the reliability of the measure (see Table 3). For example, in sub-scale “Spaces that are safe and secure”, front door secure (Saf3) was 0.90 and storage rooms lockable (Saf8) was 0.76, these two items had the highest factor loadings; floor area secure (Saf12) was -0.10 and carpeting secure

(Saf13) was -0.16, these two items had low, negative factor loadings. An interpretation of the example is that the latent construct “Spaces that are safe and secure” accounts for 80.4% of the variance in the measure front door secure (Saf3), 57.0% of the variance in storage rooms lockable (Saf8); and only 1.0% of the variance in floor are secure (Saf12) and 2.5% of the variance in carpeting secure (Saf13).

Poor factor loadings were identified in all of the subscales except for the 2 subscales that met the strived for 0.7 alpha reliability coefficient (see Table 3). The items identified by CFA as having poor factor loadings reaffirmed the items identified by Cronbach’s alpha as contributing to low internal consistency scores.

*Eliminated items.* After careful consideration of the applicability of items with poor factor loadings to the meaningfulness of the latent construct, it was felt that certain items needed to be eliminated in order to increase the reliability, validity and applicability of the sub-scales. It was felt that items that were eliminated would not account for a loss of detail in the tool as an overall measure of the presence of environmental features that support the needs of persons with dementia in ADPs. Items that were eliminated included non-variant items smoke detection device (Saf10) and colour contrast in floor (Stim7); item toilet room sizes (Vis7) which had little variation amongst ADPs and a poor factor loading; carpeting secure (Saf13) and noises outside noticeable (Stim1) which had negative factor loadings and contributed considerably to poor internal consistency scores and poor model fit; windows restricted (Saf6), floor area secure (Saf12), and kitchen noise distracting (Stim2) which were found to be poorly framed questions open to subjective responses; exit to outside seen from the lounge (Vis1), hallways, entry dark (Stim8), natural lighting (High6), lighting suitable (High7), lighting adjustable (High8),

area one-on-one (Auto1) and outdoor area (Staff4) which were found to be reflective of long-term care settings and not relevant to ADP environments as most ADPs are held in large-open concept spaces, during daylight hours and do not have access to the outdoors; toilet seen from dining room (Vis5) was eliminated as it was captured by toilet seen from lounge (Vis6), and lounge seen from staff (Vis8) was eliminated as it was captured by common area supervised (Saf14) (see highlighted items in Table 3).

After eliminating the above items, internal consistency (see Table 3) was re-tested and model fit for the reduced sub-scales was tested (see Table 4 and Appendix C. Re-tested Path Diagrams with Standardized Solutions).

Table 3: Reliability of ADPPEAT Measures

Domain and Item Number	Item Description	CFA Stand. Factor Loading <sup>6</sup>	Reliability	Reliability
			CFA SMC	% Agreement
<b>Spaces that are safe and secure</b>				
Saf1	Outdoor area secure	.26	6.5%	100%
Saf2	Program space solely for ADP	.25	6.3%	100%
Saf3	Front door secure	.90	80.4%	100%
Saf4	Side doors secure	.72	51.3%	100%
Saf5	Exit visually discreet	.26	6.8%	75%
Saf6	Windows restricted	.32	10.4%	75%
Saf7	Outdoor area supervised	.26	6.7%	100%
Saf8	Storage rooms lockable	.76	57.0%	75%
Saf9	Kitchen lockable knife drawer	.19	8.2%	75%
Saf10	Smoke detection device	-----	-----	75%
Saf11	Pots and pans small	.26	8.7%	25%
Saf12	Floor area secure	-.10	1.0%	100%
Saf13	Carpeting secure	-.16	2.5%	100%
Saf14	Common area supervised	.31	10.8%	100%
Saf15	Handrails accessible	.20	3.7%	75%
Saf16	Call buttons in bathroom	.22	6.1%	100%
Cronbach's alpha .61				
** If items Saf6, Saf12 and Saf13 deleted Cronbach's alpha .63				
<b>Spaces that have good 'visual access' and afford functional independence</b>				
Vis1	Exit to outside seen from lounge	-.15	2.2%%	100%
Vis2	Dining room seen from lounge	.40	15.7%	100%
Vis3	Kitchen seen from lounge	1.14	129.9%	100%
Vis4	Kitchen seen from dining room	.58	33.5%	100%
Vis5	Toilet seen from dining room	.10	1.0%	100%
Vis6	Toilet seen from lounge	.52	26.5%	100%

<sup>6</sup> Factor loadings and SMC values presented are initial values

SMC = squared multiple correlation

----- = non-variant item

Vis7	Toilet room sizes	-1.81	3.3%	100%
Vis8	Lounge seen from staff	.10	1.0%	100%
Vis9	Landmarks	.23	5.1%	75%
Cronbach's alpha .38				
** If items Vis1, Vis5, Vis 7 and Vis 8 deleted Cronbach's alpha .60				
<b>Spaces that reduce unwanted stimulation</b>				
Stim1	Noise outside noticeable	-.15	2.2%	100%
Stim2	Kitchen noise distracting	.05	.3%	100%
Stim3	Deliveries received in areas	2.39	572.0%	100%
Stim4	Calling system, staff paging	.21	4.5%	100%
Stim5	Blinds, drapes remain shut	.13	1.8%	75%
Stim6	Glare from surfaces	.05	.2%	75%
Stim7	Colour contrasts in floor	-----	-----	100%
Stim8	Hallways, entry dark	.03	.1%	100%
Stim9	More than one activity in room	.18	3.2%	100%
Stim10	Front entry easily visible	.03	.1%	100%
Stim11	Service entry easily visible	.23	5.1%	100%
Cronbach's alpha .48				
** If items Stim1, Stim2, and Stim8 deleted Cronbach's alpha .60				
<b>Spaces that highlight important stimuli</b>				
High1	Dining room clearly marked	.76	56.9%	75%
High2	Lounge clearly marked	.96	92.6%	100%
High3	Kitchen clearly marked	.74	55.2%	100%
High4	Toilets clearly marked	.05	.3%	100%
High5	Toilet and sink contrast	.20	3.9%	100%
High6	Natural lighting	.15	2.3%	100%
High7	Activity lighting suitable	.24	5.8%	100%
High8	Lighting adjustable	.32	10.3%	100%
Cronbach's alpha .59				
** If items High6, High7 and High8 deleted Cronbach's alpha .66				
<b>Spaces that reduce agitation and provide for planned wandering</b>				
Wand1	Defined outside path	.56	31.0%	75%
Wand2	Defined inside path	.53	29.0%	50%
Wand3	Paths allow to see into areas	.47	22.0%	50%
Wand4	Paths secure	.90	81.0%	75%

Wand5	Staff survey path	.90	81.0%	75%
Wand6	Chairs, benches along path	.80	64.0%	75%
Wand7	Signage for toilets on path	.40	16.0%	50%
Cronbach's alpha.85				
<b>Spaces that are familiar</b>				
Fam1	Decorations not familiar	.49	24.3%	100%
Fam2	Taps, light switches, doors knobs not familiar	.76	58.4%	100%
Fam3	Furniture not familiar	.67	45.5%	100%
Fam4	Institutional equipment visible	.28	8.0%	100%
Cronbach's alpha .65				
<b>Spaces that afford autonomy and control</b>				
Auto1	How many area one-on-one	.169	2.9%	75%
Auto2	How many area for activities	.212	4.5%	100%
Auto3	Flexible spaces	.409	16.8%	75%
Auto4	Dining area small groups (2-4)	.839	70.3%	100%
Auto5	Dining room table less than 6	.720	51.9%	100%
Auto6	Dining area eat alone	.492	24.2%	50%
Auto7	Separate room share meal	.316	10.0%	75%
Cronbach's alpha .62				
** If item Auto1 deleted Cronbach's alpha .63				
<b>Spaces that afford meaningful activities</b>				
Mean1	Props for use	.82	66.5%	100%
Mean2	Props reflect preferences	.97	94.8%	100%
Mean3	Multiple activities	.58	33.0%	100%
Mean4	Encouraging furniture arrang.	.31	9.6%	100%
Mean5	Large activity arrang. furniture	.49	24.0%	75%
Cronbach's alpha .77				

<b>Spaces for staff</b>				
Staff1	Room available	1.04	108.3%	100%
Staff2	Toilet available	.52	27.4%	100%
Staff3	Lockers	.55	30.1%	100%
Staff4	Outdoor area	.19	3.6%	100%
Staff5	Quiet room/counselling room	.62	38.1%	100%
				Cronbach's alpha .51
** If item Staff4 deleted Cronbach's alpha .78				

Internal consistency and model fit for “Spaces that reduce agitation and provide for planned wandering” and “Spaces that afford meaningful activities” were not re-tested as they were above 0.7 and items were found to have good factor loadings and therefore were not eliminated. Internal consistency and model fit for “Spaces that are familiar” were not re-tested, as it was felt that all items were critical to the theoretical core of the latent construct and therefore items were not eliminated. After re-testing the remaining 6 sub-scales, all ADPPEAT sub-scales met the acceptable 0.6 alpha reliability coefficient and 3 met the strived for 0.7 (see Table 3).

Additionally, the model fit tests were non-significant (chi-square test p-values were greater than 0.05 for all sub-scales); meaning that all 9 sub-scale models fit the data well (see Table 4). RMSEA values ranged from 0 to 1 for all 9 sub-scales, with smaller values indicating a better model fit and CFI values ranged from 0 to 1 for all 9 sub-scales, with larger values indicating a better fit. Four of the sub-scales met the criteria for good model fit across all 3 fit indices; chi square test with a p-value > 0.05, RMSEA < 0.08 and CFI > 0.90 (Hu & Bentler, 1999; Schrieber et al., 2006). The remaining 5 sub-scales all had relatively small RMSEA values and large CFI values with the exception of “Spaces that are safe and secure”, whose CFI score was poor (see Table 4).

Table 4: *Absolute and Relative Fit Indices for the ADPPEAT*

Model	Chi-Square	df	P-value	RMSEA	CFI
Safe and Secure	69.213	54	$p > 0.05$	.104	.505
Visually Discrete	2.155	5	$p > 0.05$	.000	1.00
Stimulating	12.917	14	$p > 0.05$	.000	1.00
Highlighting	9.732	5	$p > 0.05$	.191	.785
Wandering	22.969	14	$p > 0.05$	.157	.856
Familiar	4.068	2	$p > 0.05$	.199	.834
Autonomy	4.552	9	$p > 0.05$	.000	1.00
Meaningful	8.533	5	$p > 0.05$	.165	.879
Staff	1.731	2	$p > 0.05$	.000	1.00

*Note.* Absolute and Relative fit indices presented are those after highlighted items in Table 3 were deleted

The findings suggest that after eliminating items, the resulting 55-items provide a good measure of their respective sub-scales (internal consistency reliability). The construct validity of the ADPPEAT was also strong; the 55-item tool was shown to be able to discriminate between ADPs for the purposes of understanding how supportive the environment is for persons with dementia based on the 9 critical design principles.

In terms of inter-rater reliability, results were moderately high; the mean percentage of agreement on the 55-items ranged from 25% to 100%, 1-item (25%) was in the poor range, 4-items (50%) were in the fair range, 15-items (75%) were in the good range and 35-items had 100% agreement for all raters (see Table 3). Inter-rater reliability

was relatively good across all sub-scales except for “Spaces that reduce agitation and provide for planned wandering”; the disparities in the inter-rater reliability scores may reflect some ambiguity between ADP coordinators knowledge of the meaning of a defined path for persons with dementia and the assessors. The single item in the poor range and the 4-items in the fair range could easily be revised or clarified to increase inter-rater reliability.

Results for the face validity (content validity) of the ADPPEAT were reasonably high; ninety-three percent of ADP’s rated the tool a 7 out of 10 or higher, meaning that the majority of coordinators found the tools items to be relevant attributes of an ADP’s physical environment. Figure 3 outlines the dispersion of ratings for the face validity of the ADPPEAT as indicated by ADP coordinators. The mean rating for N=27 ADPs was 8.26 out of 10.

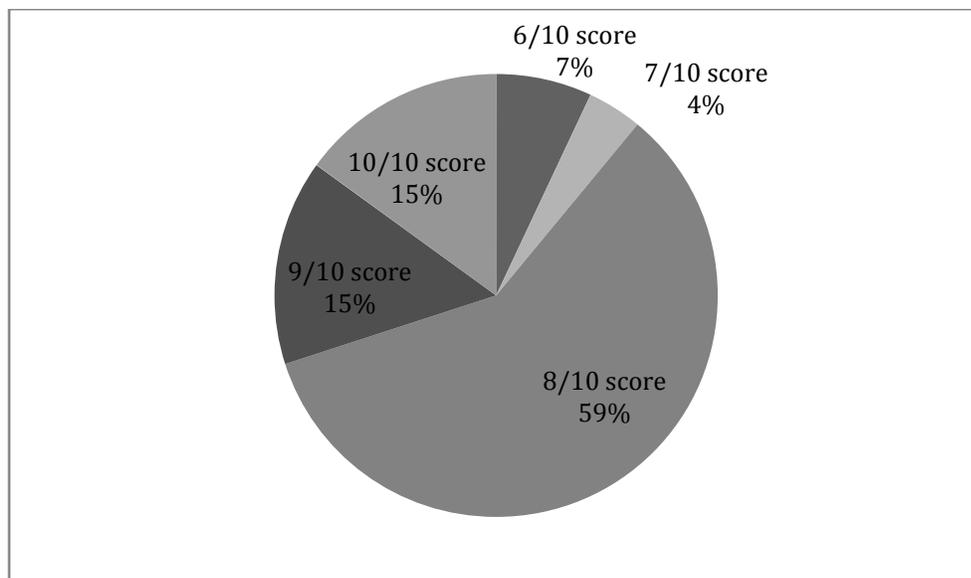


Figure 3. *Content validity rating of ADPPEAT as indicated by adult day program coordinators*

### Environmental design principles.

In addition to the reliability and validity testing of the tool, data collected from the ADPPEAT were analyzed to fulfill objective 2. Descriptive statistics on the ADPPEAT items and sub-scale scores were analyzed to assess the extent to which Nova Scotia's ADP environments implement the key physical design principles critical to supporting the needs of persons with dementia (see Appendix D.). Only physical environment design features were analyzed; it is important to acknowledge that many supportive components involved in the care for persons with dementia in adult day programs were not analyzed in this research.

Strengths and weaknesses in ADP environments were identified. Six of the sub-scale's calculated means were below 5.00, indicating that the physical environment design features of the program were in need of improvement in order to better support the environmental needs of persons with dementia, with "Spaces that highlight important stimuli" having the lowest mean score ( $M = 3.41$ ) (see Figure 4.).

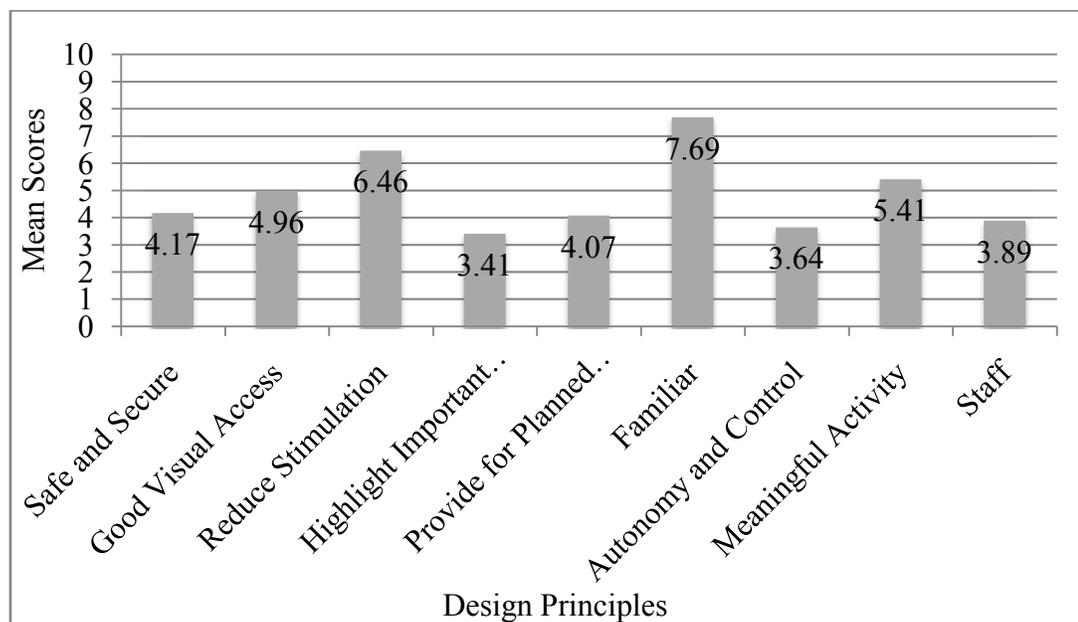


Figure 4. *Environmental Design Principle Mean Scores.*

For example, for “Spaces that highlight important stimuli”, although 66.7% of ADPs had toilets that were clearly marked and 74.1% had toilets that contrast with the colour of the sinks, very few programs had the kitchen (14.8%), dining room (3.7%) and the lounge (11.1%) clearly marked (see Figure 5.).

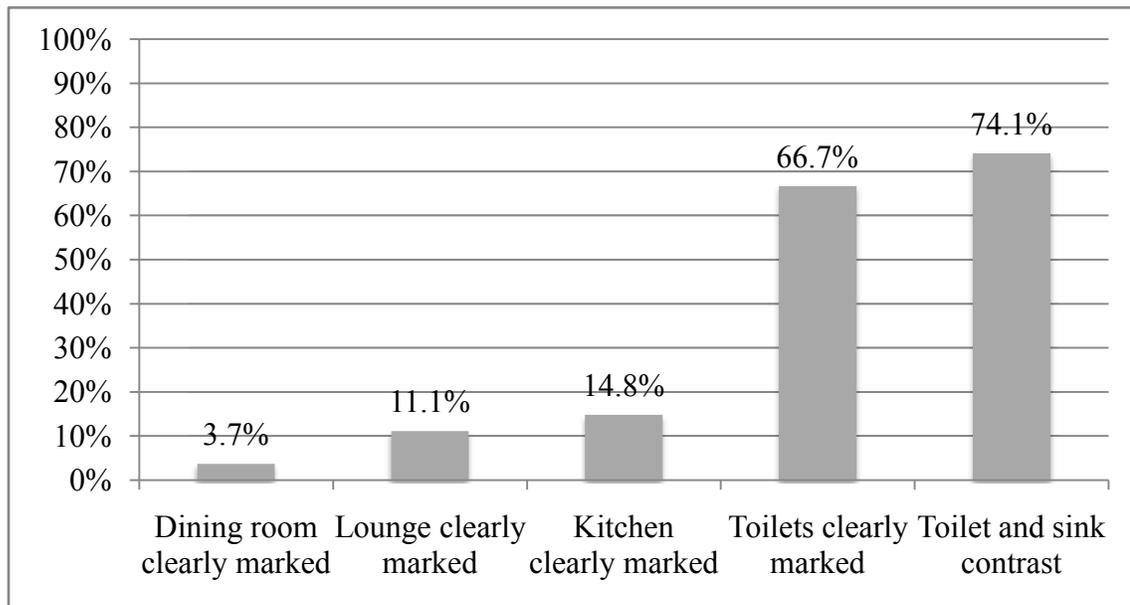


Figure 5. *Item Percentages for Spaces that Highlight Important Stimuli.*

For “Spaces that are safe and secure” ( $M = 4.17$ ), the majority of ADPs had common areas that were easily supervised (96.3%), secure front doors (59.3%) and side doors (59.3%) and storage rooms that were lockable (70.4%). However, handrails being easily accessible (25.9%), call buttons in the bathroom (44.4%) and exits that were visually discreet (11.1%) were not as prevalent. For “Spaces for staff” ( $M = 3.89$ ), less than half of the ADPs had specific rooms for staff (44.4%), toilets for staff (29.6%) and lockers for staff (18.5%).

Three of the sub-scale’s calculated means were above 5.00, indicating a moderately acceptable level of support for the environmental needs of persons with dementia. “Spaces that are familiar” had the highest mean score ( $M = 7.69$ ) with 70.4%

of ADPs having decorations, furniture (70.4%) and items such as taps, light switches and doorknobs (74.1%) that were familiar to the participants (see Appendix D. for descriptive statistics of the ADPPEAT items).

### **Profile of adult day programs.**

Furthermore, characteristics of the variables used to describe ADPs were looked at in order to categorize and compare the various ADPs (see Table 5). All of the ADPs were found to vary in frequency of hours of operation, building type, services offered, cost and type of clientele served (see Table 5).

Table 5: *Descriptive Features of Nova Scotia's Adult Day Programs (N = 27)*

<b>Adult Day Program (ADP) Profile</b>	<b>n</b>	<b>% of ADP Sample</b>
<b>DHA</b>		
South Shore Health	3	11%
South West Health	2	7%
Annapolis Valley	2	7%
Colchester East	3	11%
Cumberland	3	11%
Pictou County	1	4%
Guysborough	1	4%
Cape Breton	3	11%
Capital Health	9	33%
<b># of Clientele Per Day</b>		
10 or less	10	37%
11-16	12	44%
17-29	5	19%
<b>Type of Clientele</b>		
Dementia only	2	7%
Mix between dementia and non-dementia	22	82%
Mostly non-dementia	3	11%
<b>Building Type</b>		
<b>Community-Based</b>		
Community Centre	10	37%
Church	4	15%
Private Residence	1	4%
<b>Institutional-Based</b>		
Nursing Home	9	33%
Hospital	2	7%

<b># of Days Open Per Week</b>		
1	11	41%
2-3	7	26%
4+	9	33%
<b>Hours of Operation/Day</b>		
3-5hrs	7	26%
6-8hrs	20	70%
<b>User fees for Full Day</b>		
\$0-\$15	11	55%
\$16-\$30	9	45%
<b>User fees for Half Day</b>		
\$0-\$15	19	95%
\$16-\$30	1	5%
<b>DHA/DHW Funding</b>		
Yes	18	67%
No	9	33%
<b>Support for Program</b>		
Part of Larger Network	25	93%
Stand Alone	2	7%
<b># of Years of Operation</b>		
0-2	3	11%
3-4	11	41%
5-6	4	15%
7+	9	33%
<b>Size of Space (in square feet)</b>		
0-800	16	59%
801-1600	7	26%
1601+	4	15%
<b>Services Offered</b>		
Only Activities	10	37%
Activities & Nursing/Medical	6	22%
Activities & Therapeutic	4	15%
Activities & Nursing/Medical & Therapeutic	7	26%

*Note.* DHA = District Health Authority; DHW = Department of Health and Wellness

Crosstabs were done in order to make comparisons between ADPs that were supported with DHA/DHW funding and ADPs that were not (see Appendix E. for crosstabs). The crosstabs showed that ADPs that were supported with DHA/DHW funding were more often located in an institutional-based building, were open more days per week, more hours per day and were more likely to be open for full-day programming and offer nursing/medical services than ADPs not supported with DHA/DHW funding

(see Figure 6 and 7 for examples).

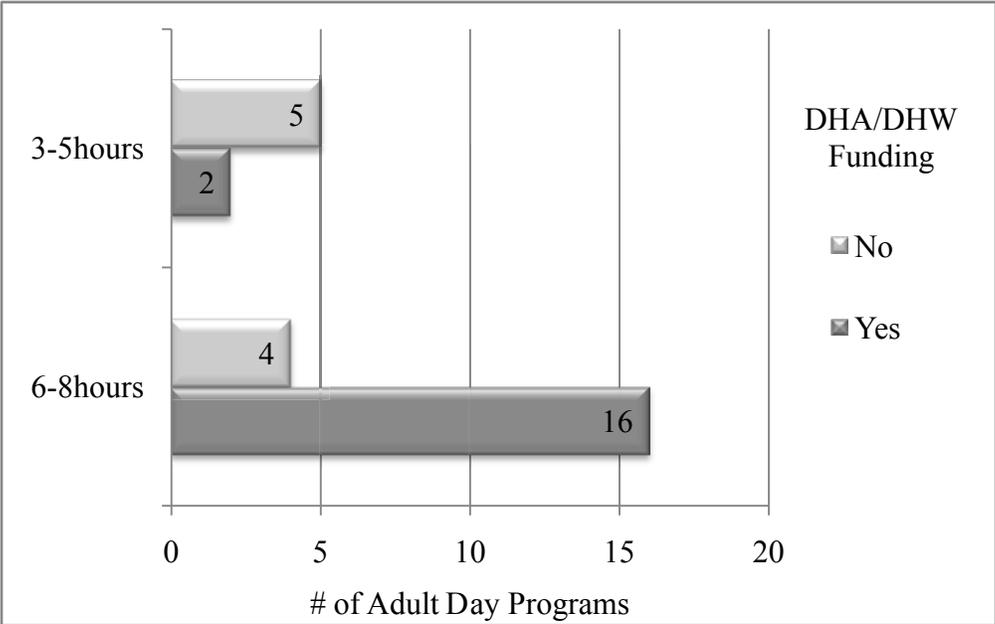


Figure 6. Hours of Operation Per Day by DHA/DHW Funding.

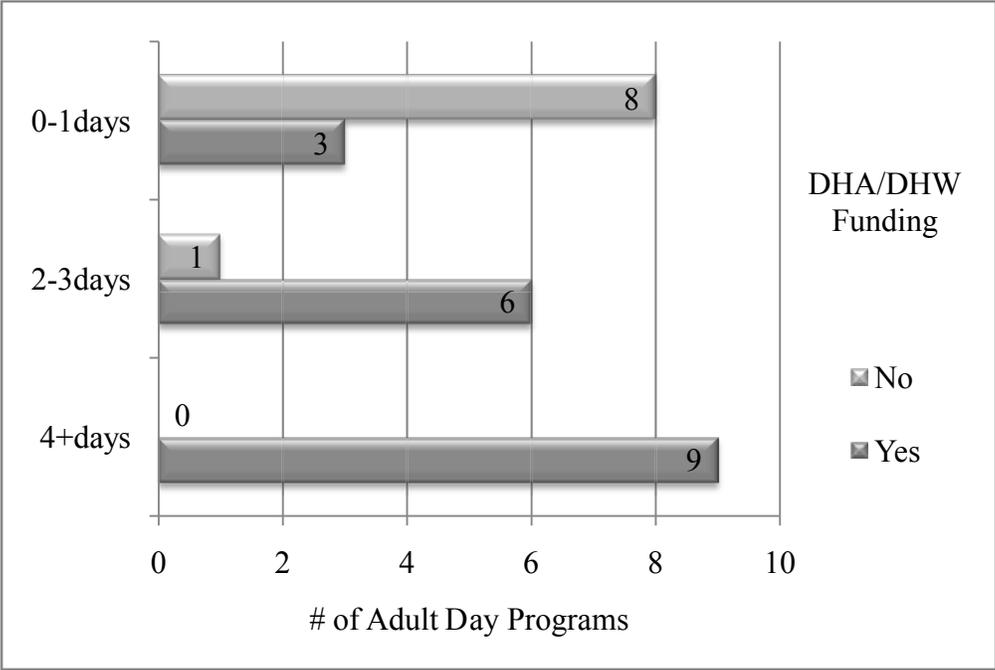


Figure 7. # of Days Open Per Week by DHA/DHW Funding.

### Factors affecting design principles.

A one-way ANOVA was conducted using the scores on the 9 sub-scales as dependent variables and the 13 characteristics (categorical variables) of ADPs as independent variables to compare the differences in scores amongst different types of ADPs. ANOVA indicated 26 significant relationships between seven of the categorical variables and seven of the sub-scales (see Appendix F. ADP Categorical Effects on Physical Environment Design Principles).

*Building type.* The results from the one-way ANOVA suggest that ADPs that were in an institutional-based building had significantly more design features that provide for safety and security [ $F(1, 24) = 8.128, p < .01$ ], autonomy and control [ $F(1, 24) = 5.275, p < .05$ ], meaningful activities [ $F(1, 24) = 4.436, p < .05$ ], and that reduce agitation and plan for wandering [ $F(1, 23) = 4.425, p < .05$ ], than ADPs in community-based settings (see Figure 8. and Appendix F).

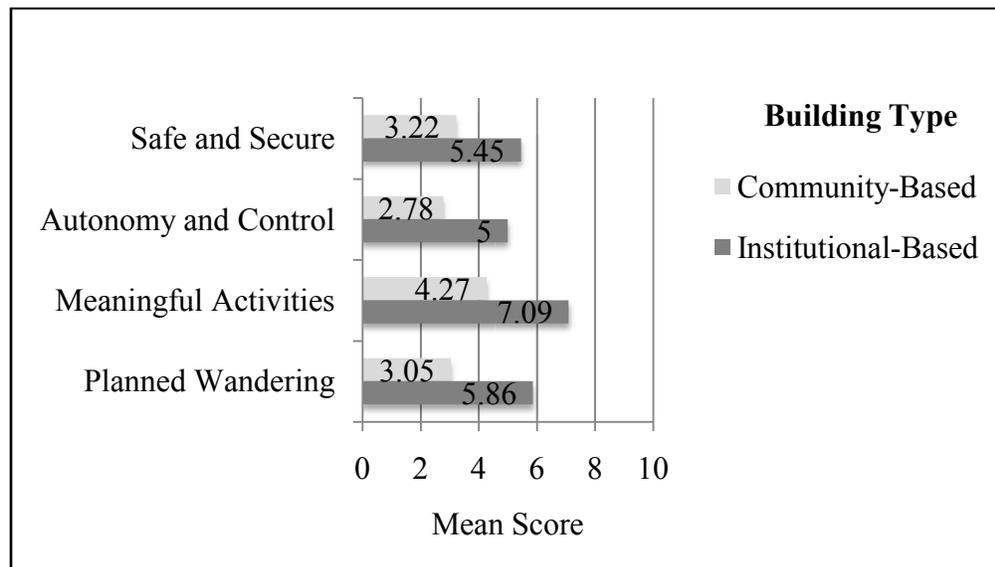


Figure 8. *Design Principle Mean Scores by Building Type.*

*# of days open per week.* The results from the one-way ANOVA suggest that ADPs that were open more than 1 day a week had significantly more design features that provide safety and security [F (2, 24) = 4.309,  $p < .05$ ], better ‘visual access’ and functional independence [F (2, 24) = 8.389,  $p < .01$ ], autonomy and control [F (2, 24) = 3.823,  $p < .05$ ], meaningful activities [F (2, 24) = 13.616,  $p < .01$ ], and space for the staff [F (2, 24) = 18.657,  $p < .01$ ] than ADPs open 1 day a week (see Figure 9. and Appendix F.).

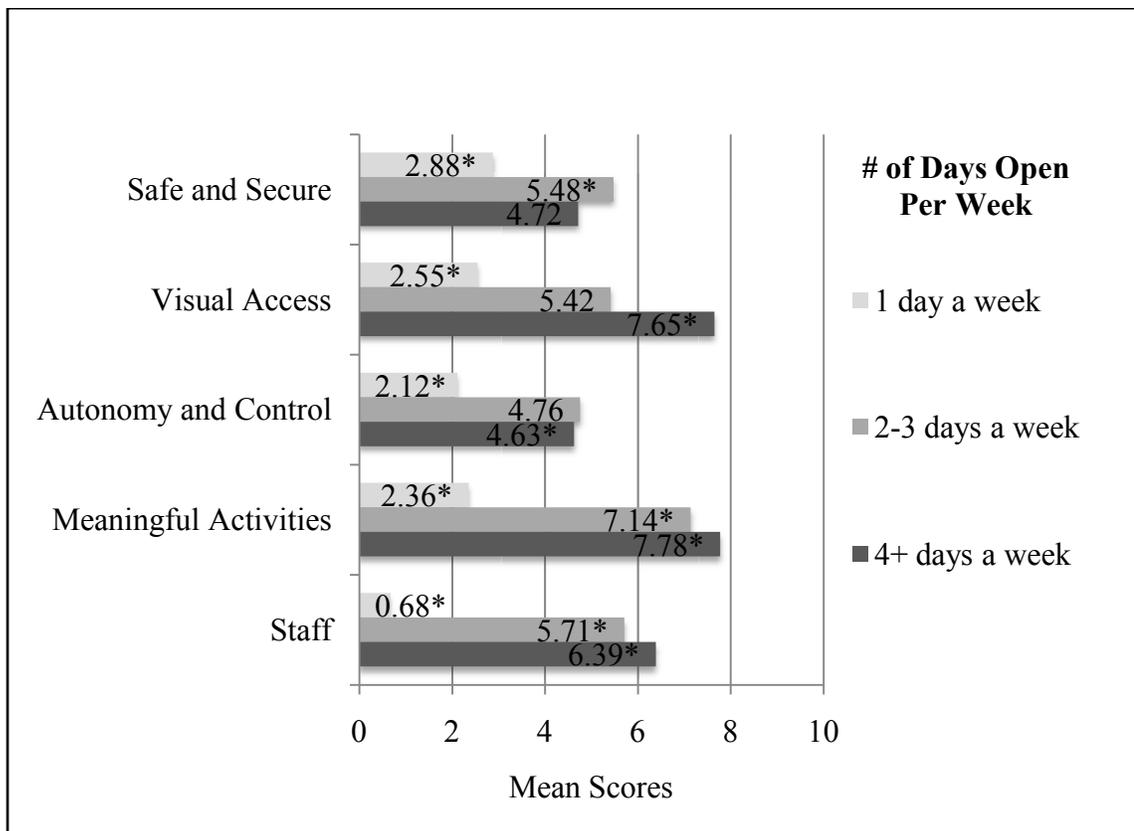


Figure 9. *Design Principle Mean Scores by # of Days Open Per Week*<sup>7</sup>.

<sup>7</sup> \* = The mean score is significant.

*Hours of operation per day.* The results from the one-way ANOVA suggest that ADPs that were open for 6-8 hours a day had significantly more design features that provide safety and security [ $F(1, 25) = 4.561, p < .05$ ], better 'visual access' and functional independence [ $F(1, 25) = 12.032, p < .01$ ] and meaningful activities [ $F(1, 25) = 12.652, p < .01$ ], than ADPs open 3-5 hours a day (see Figure 10. and Appendix F.).

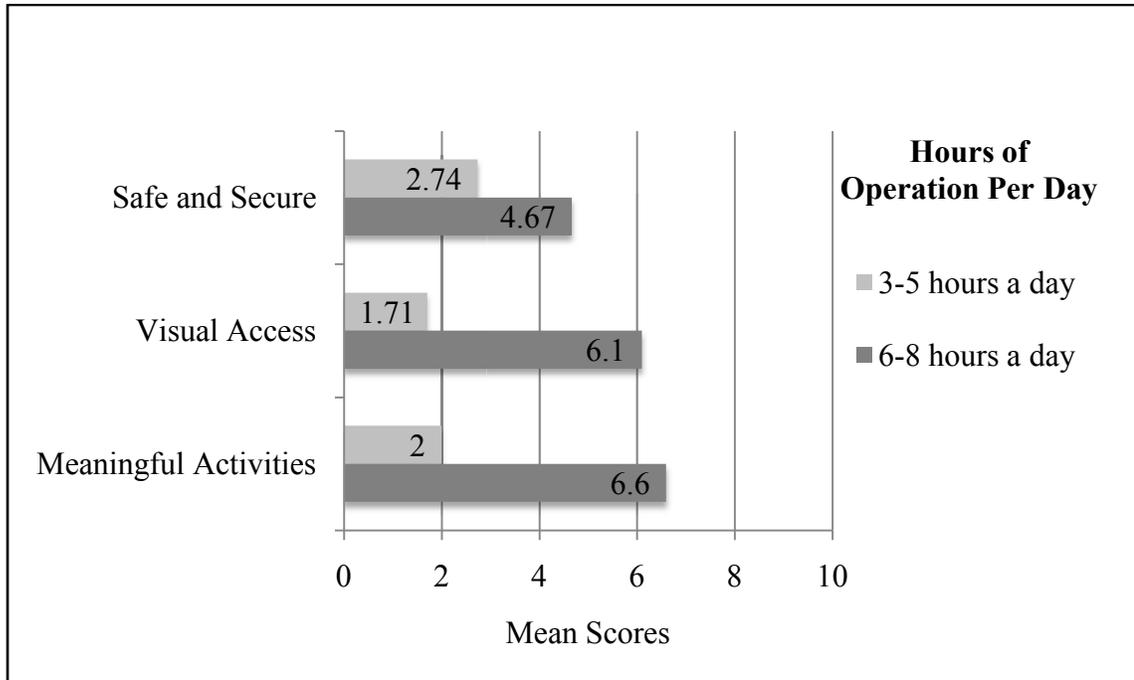


Figure 10. *Design Principle Mean Scores by Hours of Operation Per Day.*

*Length of program by user fees.* The results from the one-way ANOVA suggest that ADPs that were open for a full day at a cost to the user of either \$0-\$15 or \$16-\$30 had significantly more design features that provide safety and security [F (2, 23) = 8.447,  $p < .01$ ], good 'visual access' and functional independence" [F (2, 23) = 10.257,  $p < .01$ ], autonomy, and control [F (2, 23) = 4.78,  $p < .05$ ], meaningful activities [F (2, 23) = 16.655,  $p < .01$ ], and space for the staff [F (2, 23) = 12.63,  $p < .01$ ], than ADPs that were open for half a day (see Figure 11. and Appendix F.).

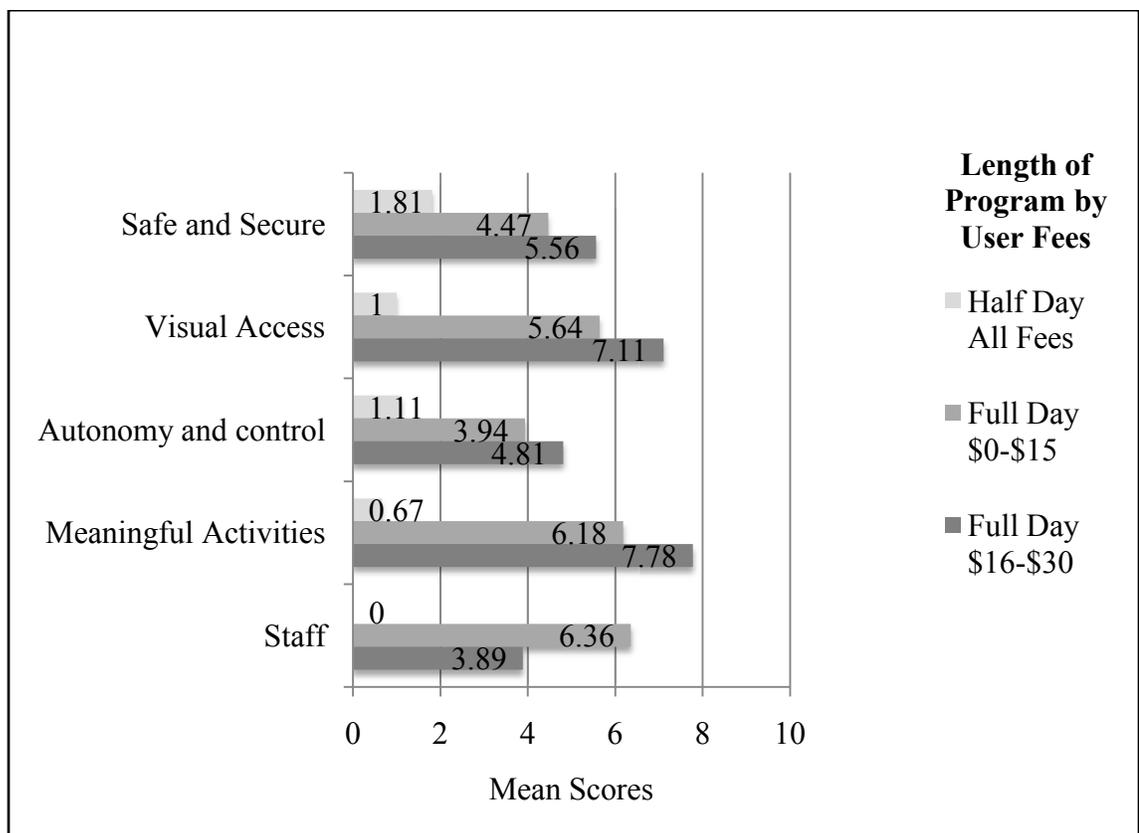


Figure 11. *Design Principle Mean Scores by Length of Program by User Fees.*

*DHA/DHW Funding.* The results from the one-way ANOVA suggest that ADPs that were supported with DHA/DHW funding, had significantly more design features that provide safety and security [F (1, 25) = 12.552,  $p < .01$ ], better 'visual access' and functional independence [F (1, 25) = 9.672,  $p < .01$ ], autonomy, and control [F (1, 25) = 8.02,  $p < .01$ ], meaningful activities [F (1, 25) = 14.245,  $p < .01$ ], and space for the staff [F (1, 25) = 22.50,  $p < .01$ ] than ADPs not supported with DHA/DHW funding (see Figure 12. and Appendix F.).

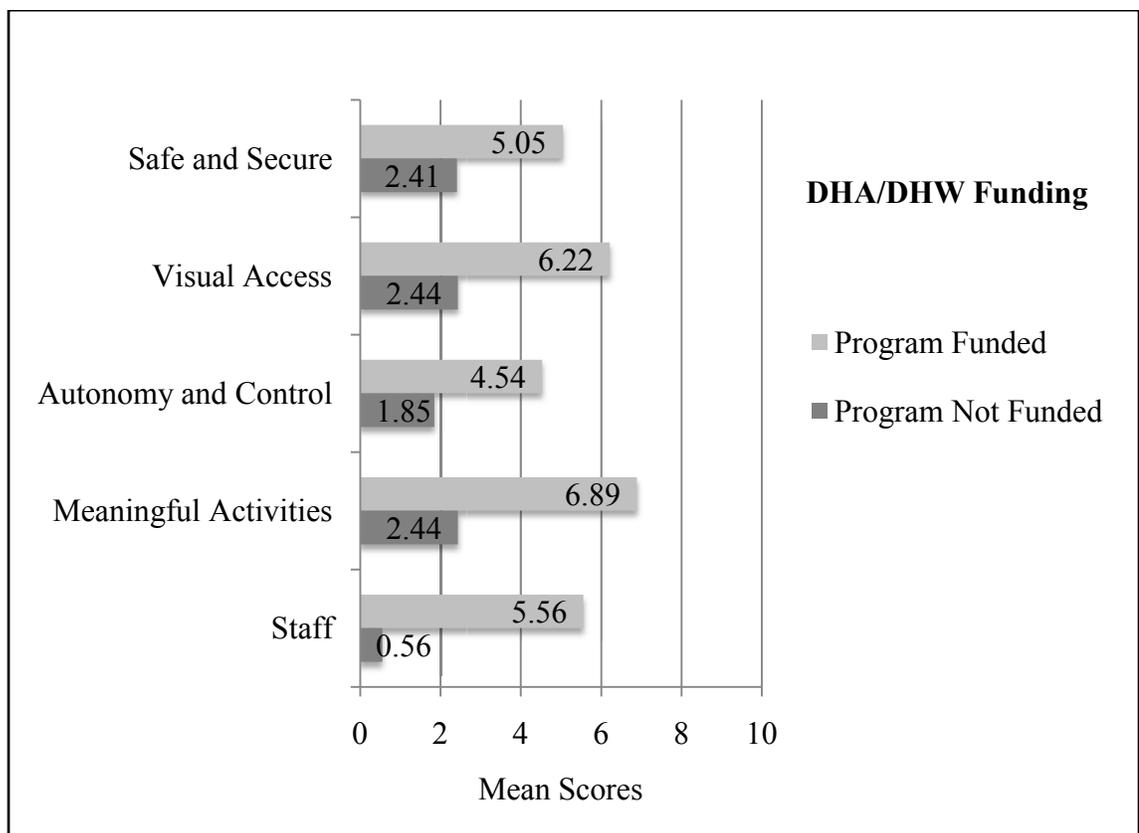


Figure 12. *Design Principle Mean Scores by DHA/DHW Funding.*

*Size of program space in square feet.* The results from the one-way ANOVA suggest that ADPs that were held in a space that is 801+ square feet had significantly more design features that provide better 'visual access' and functional independence [ $F(2, 24) = 5.743, p > .01$ ] than ADPs held in a space of 0-800 square feet. However, ADPs held in 801-1600 square foot spaces had significantly less design features that highlight important stimuli [ $F(2, 24) = 5.868, p < .01$ ], than ADPs held in 0-800 and 1601+ square foot spaces (see. Figure 13. and Appendix F.).

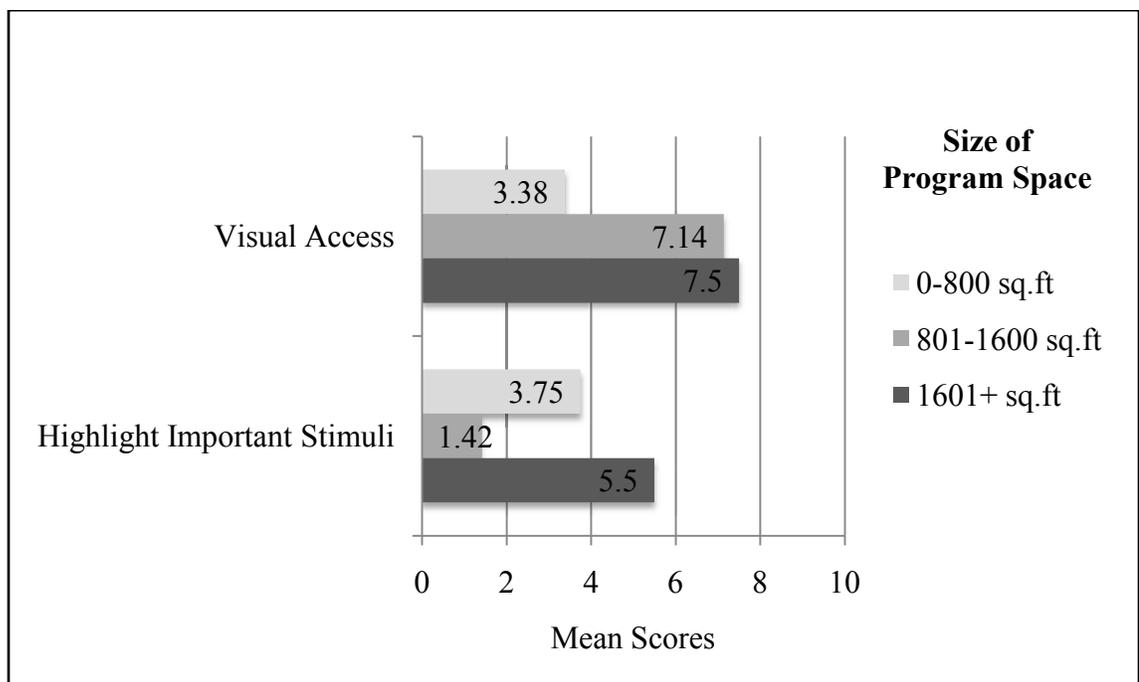


Figure 13. *Design Principles by Size of Program Space.*

*Types of services.* The results from the one-way ANOVA suggest that ADP's with activities and nursing/medical services had significantly more design features that provide better 'visual access' and afford functional independence [ $F(2, 23) = 5.824, p < .01$ ], and meaningful activities [ $F(2, 23) = 4.901, p < .01$ ] than ADPs with only activities or ADPs with activities and therapeutic services (see. Figure 14. and Appendix F.).

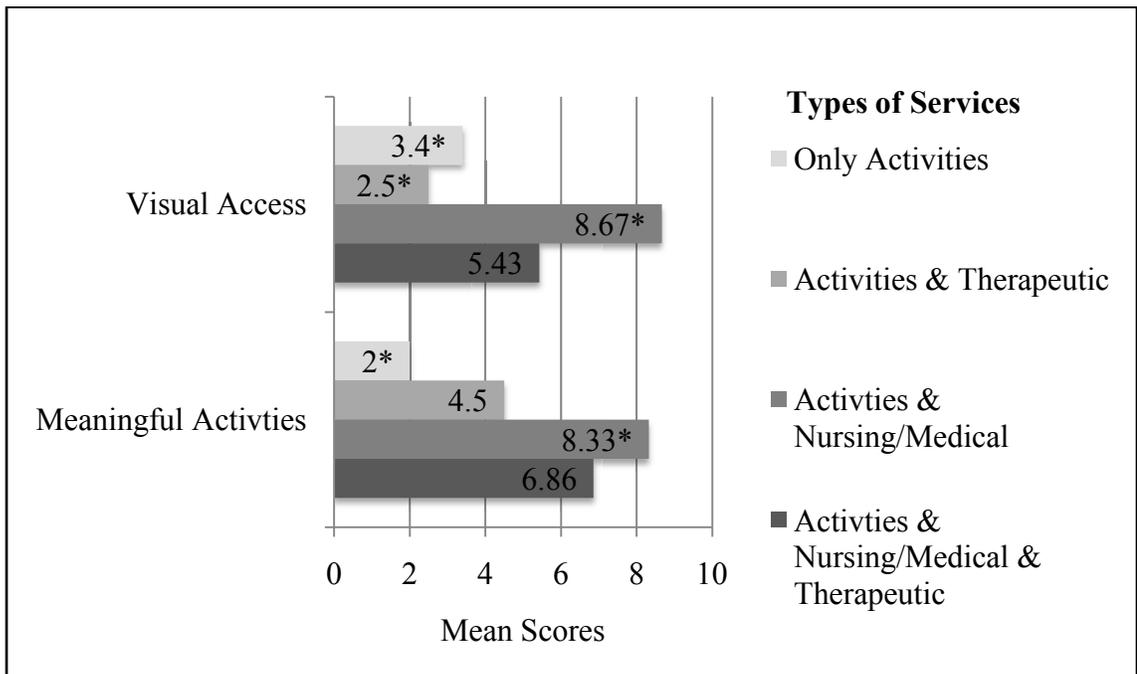


Figure 14. *Design Principles by Types of Services*<sup>8</sup>.

The crosstabs and ANOVA results suggest that ADPs that were supported with DHA/DHW funding were more likely to have program characteristics that were found to be significantly associated with having more environmental design features than programs that were not supported with DHA/DHW funding.

<sup>8</sup> \* = The mean score is significant.

**Perspectives of program coordinators.**

Of the ADP coordinators that responded to the open-ended narrative questions included in the ADPPEAT, a frequent response was that ADPs were held in a large open concept recreation space, where one main room was used for a dining area and all activities. Many coordinators mentioned facility limitations such as not having client washrooms specifically for males and females, windows that did not open, no access to an outside area for participants to wander because “really if they are a flight risk we cannot look after them as we are not locked” (ADP coordinator- nursing home).

ADPs in shared spaces were also mentioned as being a challenge. One ADP coordinator stated, “facilitating an ADP program in a shared space has many challenges as the physical environment does not have all of the features that would be ideal in running this type of program” (ADP coordinator- church). Another coordinator mentioned, “it is important to assess the space prior to each program session to monitor changes and identify new hazards” (ADP coordinator – nursing home).

Many coordinators expressed positive aspects about their program from having a great view, being bright, having a whirlpool tub, access to a hairdressing room, gardening activities and raising “money to purchase gifts and prizes for games, birthdays, an outing for them for Christmas dinner, special meals (once or twice a year) and anything else that is over and above a meal here” (ADP coordinator- nursing home). A few coordinators mentioned the importance of socialization, “another big reason for our clients to be here is socialization, they may be alone at home and this is their only chance to see others that they can relate to” (ADP coordinator- nursing home).

One ADP coordinator mentioned that they “do a lot of education for the

caregivers, as caregivers don't know much about dementia and are typically at their ends wit when they get here. Most caregivers do not care about seeing the program as “respite”, but rather want it to be something in which their loved ones will receive benefits from” (ADP coordinator- nursing home).

Coordinators provided insight into lack of funding, support and referrals; mentioning the need for more acknowledgment in the continuing care sector and assistance with promotion of the programs as so few people are aware of their program availability. “Our problem to overcome is to get more participants and it seems the fee that is charged to participate is what is preventing more people from attending. More people could benefit from this program if financial support for low-income people was provided” (ADP coordinator- community centre). Program coordinators from programs that were not supported with DHA/DHW funding were particularly vocal on this point, as one representative wrote there is a need “for more funding from government agencies as the programs are very cost effective and a great resource to assist caregivers with keeping their loved ones at home longer” (ADP coordinator – nursing home).

## Discussion

The World Health Organization (2012) recently released a report deeming dementia a public health priority:

The growing prevalence and impact of dementia is not well understood. This is likely to be reflected in a lack of policy direction and program development and inappropriate allocation of funding. It is obvious that dementia, its consequences and responses can no longer be neglected and that it is time that dementia is considered part of the public health agenda by all stakeholders. (p. 9).

Given that the Atlantic Provinces have the largest proportion of older people in Canada and are therefore susceptible to major impacts on the public health care and continuing care sector, more attention should be reapportioned from a focus on institutional environments toward improving the environments of choice of older adults, specifically their own homes and communities (Geboy, Diaz Moore, & Smith, 2012). The need for specially-adapted dementia care environments needs to be conveyed to key stakeholders such as staff members, caregivers, inspectors, policy makers and interior designers. Environments with adaptations for persons with dementia will ‘look different’ from environments built for cognitively-able individuals (Lawton & Nahemow, 1973). For example, they will “use objects and bright colour specifically for highlighting important cues and information, have minimal or no patterns in flooring and textiles” (Jones & van der Eerden, 2008, p. 26). Educating individuals about the purpose, use and importance of specially-designed care environments is important as community-based environments begin to be utilized as dementia care environments. Reliable design evaluation instruments can help to evaluate and improve environmental design in the

community care sector.

### **The Adult Day Program Physical Environment Assessment Tool.**

This was the first study of its kind that attempted to develop a set of scales to evaluate ADP physical environments. The objective was to develop a reliable and valid tool to assess the presence or absence of key physical design principles found to be critical to supporting the needs of persons with dementia in ADP environments. The items that were selected to remain in the tool had to have a reasonably varied distribution in the sample in order to be able to differentiate amongst different types of ADP environments. However, some features, which were present in most of the ADPs, were retained in order to allow for greater understanding of the attributes of an ADP's physical environment. Items that were not found to be reflective of ADP settings were eliminated. The 55-items selected to remain under the 9 design principles were found to be reliably and validly unified by their sub-scale 'message' and their implication for persons with dementia. Of the 9 sub-scales, three met the strived for 0.7 alpha reliability coefficient, indicating good internal consistency, and the remaining 6 sub-scales were above .60, indicating acceptable internal consistency (Bland and Altman, 1997). All ADPPEAT sub-scales achieved acceptable model fit (construct validity) and all sub-scales achieved good inter-rater reliability (see Table 3). Overall, there was high consensus amongst coordinators that the ADPPEAT items were relevant attributes of an ADPs physical environment (content validity).

The resulting ADPPEAT, comprised of 55-items, provides coordinators and program evaluators with a relatively quick (15-20minutes) and easy way to obtain information on ADP environmental features, which can be used to compare with other

ADPs. After removing items the ADPPEAT became more efficient, effective and applicable to an ADP environment; as well the tool became more user-friendly by reducing the amount of time it takes to complete it. Assessments and comparisons of ADP environments using the ADPPEAT can provide feedback to staff members in order to educate and increase awareness amongst them about the impact the environment may have on persons with dementia. The ADPPEAT may also prove useful in efforts to produce environmental change, both for indicating potential areas for change and for monitoring the results of these efforts.

As the only environmental design measurement tool of its kind for adult day programs, the ADPPEAT provides a good indication of how supportive an ADP environment is for people with dementia, allows for comparison of one environment with another and enables weaknesses in the environment to be identified in order to describe changes that can be made in the physical environment in attempt to make them more suitable for people with dementia (Fleming, 2011). As Canadian provinces begin to consider environmental design in the expansion process of community care settings, these results are likely to be of great value. In addition the measurement tool (ADPPEAT) may prove useful as a benchmark for future strategies.

#### **Physical design of Nova Scotia's adult day program environments.**

The level of detail in information collected from the ADPPEAT is intended to present a rich source of ideas for improvement where improvement is necessary (see Appendix D. Descriptive Statistics of the ADPPEAT Items). Weaknesses in the physical design of ADP environments were identified, and are discussed according to Lawton's (1989) classification of environments as having three main functions: maintenance,

stimulation and support, as a means of understanding how the design of the environment impacts the behaviour of persons with dementia (as cited in Degenholtz et al., 2006). Physical environments should be designed to support independence, engage people and give meaning, comfort and safety (Alzheimer Society of Canada, 2011; Victoria, Australia Department of Health, 2011). It must be acknowledged that people with dementia do not experience themselves and their physical and social environments as separate. Each element, the personal, physical and social, comprise an integral piece to understanding the experience of the person with dementia, therefore it is important to recognize that many supportive components involved in the care for persons with dementia in adult day programs were not included in this research.

*Environments that maintain*

Environments that maintain a sense of self and affirm dignity for persons with declining cognitive abilities will enable the individual to safely move around the environment independently and discourage the appeal to leave (Jones & van der Eerden, 2008). Nova Scotia's ADP environments were found to be relatively secure with 70.4% of ADPs having storage room doors lockable, supervised common areas (96.3%) and secure front (59.3%) and side doors (59.3%). However, dementia-friendly safety design features such as easily accessible handrails along the walls of all spaces (25.9%) and non-visible, camouflaged doors (11.1%) were not as prevalent. Environmental features that can be recommended for ADPs are features such as visual barriers serving to camouflage the panic bar or door knob which are "effective and cost efficient controls for wanderers' exiting" or installing closed, matching mini-blinds that restrict light, and views through exit door windows which can reduce exiting attempts by half (Dickinson, McLain-Kark,

& Marshall-Baker, 1995, p. 129).

There is good evidence that assisting persons with dementia to find their way around by preserving their mobility, encouraging them to explore and optimizing their engagement with and enjoyment of the environment assists in reducing anxiety and depression while improving social interaction (Jones & van der Eerden, 2008; Zeisel et al., 2003). Design features that encourage mobility and help to orient the individual to the environment are such things as good visual landmarks, sign posting and clear pathways that help the client find their way back to their initial starting point and provide information about the purpose of each area. The majority of ADPs were sufficient in facilitating the individual to preserve continence for as long as possible by helping them to locate the toilets strategically through clear visual signs (66.7%); and ensuring that the toilet is of a suitable high contrast to the background walls and sink area (74.1%), however, very few ADPs were found to provide good visual access to toilets from the dining room (33.3%) and the lounge areas (37%). Orientation cueing was also relatively poor in ADPs, with very few programs clearly marking the kitchen (14.8%), dining room (3.7%) and the lounge (11.1%) (Spaces that highlight important stimuli,  $M = 3.41$ ). Very few ADPs (22.2%) had a defined path inside, as one ADP coordinator indicated, “our space is 1 large room and an office area. There are no paths between activities as all take place in one room” (ADP coordinator- community centre).

People with dementia tend to have memory loss, disorientation and loss of ability to interpret what they see and hear; the goal is to find a balance between maintaining safety for persons with dementia and ensuring individual autonomy and comfort in the environment (Alzheimer Society of Canada, 2011). With low mean scores on “Spaces

that are safe and secure” (M = 4.17), “Spaces that have ‘good visual access’ and afford functional independence” (M = 4.96) and “Spaces that reduce agitation and provide for planned wandering” (M = 4.07) improvement in these design features is necessary in order to utilize ADPs as a suitable support for persons with dementia. “Poorly designed environments may induce learned helplessness because of the individual’s perceptions that they have no control over their lives (Cutler et al., 2006).

*Environments that stimulate*

There is evidence for the beneficial effects of providing people with dementia with an environment that gives them an opportunity to engage in ordinary activities of daily living (Cunningham, 2008; Diaz Moore et al., 2006; Reimer, Slaughter, Donaldson, Currie, Eliasziw, 2004). Frequent and easy engagement in meaningful activities will enhance their well being and reduce agitated behaviours such as “pacing and wandering, screaming and other strange noises, constant requests for attention, repetitious mannerisms, inappropriate handling of things or picking at things, and strange movements” (Cohen-Mansfield and Werner 1995, p. 35). With 37% of ADPs having access to two or more rooms to hold activities in, easy engagement in meaningful activities without distractions is severely limited. Although 52% of ADPs do try to offer multiple activities for participants to choose from, these activities are held in one large open space, which can be over stimulating for someone with declining cognitive abilities (Lawton et al., 2000). Many of the programs (59.3%) were found to offer props that reflect the participant’s preferences in order to help encourage engagement in activities. Design features for “Spaces that afford meaningful activities” (M = 5.41), can be improved by such things as using wall barriers between activities to reduce stimulation;

however, overall ADPs seem to be reasonably supportive in offering spaces that afford meaningful activities. While a low mean score on ‘Spaces that afford autonomy, and control’ ( $M = 3.64$ ) indicates poor environmental design of spaces, the majority of ADPs were found to use their spaces as flexible spaces (70.4%) depending on the needs of the clientele, in which they often arrange their furniture (74%) in order to encourage social interaction amongst participants. “There is strong evidence that placement of furniture in small flexible groupings in public spaces such as lounges and waiting areas can support social interaction” (Joseph, 2006, p. 5). All ADPs (100%) use their space to offer some activities for participants and therefore support the well being of participants through increased socialization and engagement in activity; improvements in environmental design features would resultantly strengthen the benefits of these services for participants and staff.

#### *Environments that support*

The careful optimization of levels of stimulation is well supported (Cohen-Mansfield and Werner 1995; Zeisel et al. 2003). Specific elements of the environment that compensate for reduced competencies, have been thoroughly investigated and found to be effective in supporting persons with dementia (Dickinson et al., 1995; Joseph, 2006). For example, dark areas and colour contrast in floors are avoided by persons with dementia and can invoke fearful behaviour when persons and objects are not readily interpretable, “what we see effects us emotionally” (Jones & van der Eerden, 2008, p. 21). Results showed that all ADPs indicated there were no colour contrast in the floors, 92.6% did not have dark hallways or entryways and 81.5% had glare free surfaces, which help persons with dementia, enhance legibility and background distinction. Visual difficulties

and resultant misperceptions can elicit fearful behaviour (Jones & van der Eerden, 2008). The majority of ADPs were found to implement design features that help to reduce these behaviours, which was reflected by the mean score for “Spaces that reduce unwanted stimulation” ( $M = 6.46$ ). However, barriers were identified by the prevalence of items that tend to be over-stimulating, and prompt fearful behaviours; for example, 40.7% of ADPs had overhead calling/paging systems, 44.4% had distracting noises outside the program space and 33.3% had more than one activity going on in the same room at the same time. ADPs were reasonably successful in creating “Spaces that are familiar” ( $M = 7.69$ ) by having design features that depict positive emotional affect and happy familiarity, for example 60% of ADPs have furniture and decorations that are familiar to the clientele, and 92.6% have no unfamiliar institutional equipment present (Joseph, 2006).

Reducing difficult behaviours and stressful situations for persons with dementia as well as providing space exclusively for staff, who work under challenging conditions and experience both physical and emotional stress, ultimately helps to reduce the stress experienced by staff, which in turn most likely impacts the client with dementia positively (Calkins, 2005). Noticeable barriers were that less than half of the ADPs were equipped with the resources to provide “Spaces for staff” ( $M = 3.89$ ). Design features such as separate rooms (44.4%), separate toilets (29.6%) and locker areas (18.5%) for staff were infrequently present.

There are two distinct ways to conceive of the behaviour of persons with dementia: “either as ‘abnormal in a normal world’ or as ‘relatively normal’ in an abnormally perceived world” (Jones & van der Eerden, 2008, p. 10). Living with

dementia should frame design. This involves seeing the world through the eyes of people living with dementia (Victoria, Australia Department of Health, 2011). Incorporating some design suggestions can be challenging if the funding is limited, and if the layout and size of the property is limiting “such as providing different areas for different activities, providing a safe and secure wandering path, and providing accessible safe, outdoor garden areas” (Jones & van der Eerden, 2008, p. 22). Others however, such as visual cues and signage that are highly visible, familiar, and noticeable and removal of over-stimulating features such as overhead/calling or paging systems can more easily be achieved.

“Tailoring environments does not necessarily translate into more costly buildings, but rather requires very clear design efforts and specific, accurate use of materials and resources” (Jones & van der Eerden, 2008, p. 3). Poor design is also costly. The importance of the design for persons with dementia is a key component in providing quality support services in the community sector; the relative value of design interventions needs to be carefully considered, along with remedies for the problems observed.

#### **Nova Scotia’s adult day programs as a support for persons with dementia.**

The categorical information collected in order to categorize and compare the various ADPs reflected great variation amongst the ADPs as was initially suspected. Particular design features of ADP environments were found to be significantly more supportive for persons with dementia than others and are discussed accordingly. The majority of ADPs serve a mix of dementia and non-dementia clientele (82%). These findings confirmed the statement by the Department of Health and Wellness that the

majority of ADPs in Nova Scotia serve the needs of individuals with memory loss and confusion from Alzheimer's disease and other forms of dementia (Nova Scotia Department of Health and Wellness, 2011). Although many people with dementia have significant medical problems, 37% of ADPs did not offer medical or therapeutic services but rather provided personal care and social and recreational activities. Of the 13 ADPs that provided nursing/medical services only one was from an ADP that was not supported with DHA/DHW funding. The staff members in these ADPs typically consist of volunteers and "paraprofessionals with no certification and no particular training required except perhaps on-the-job training" (Spinks, 2005, p. 48). Two of the non-funded ADPs that were visited for crosschecking data had two staff members, with no training, who assisted up to 16 clients to the bathroom throughout the day. Medical monitoring and therapy are important not only to attend to urgent problems, but also to assess and monitor the chronic health problems of participants who are often fragile and non communicative.

Of the programs that mainly serviced clients with mostly no-dementia diagnoses (19%), all were willing to accept clients with dementia. ADPs "willing to accept clients with dementia often discharge people as they advance beyond early stages because the centers cannot deal with the behavioural problems; this often leads to unnecessary institutionalization" (Spinks, 2004, p. 50). The response from a coordinator confirmed this by stating that "the client with dementia must be in the initial stages of their diagnosis, otherwise we would not be able to accept the client to the program due to the clients inability to function in the program space and the limited resources of the program" (ADP coordinator– community centre). Environments that are conventionally designed

for cognitively-able individuals may constrain or limit those with lower levels of functioning (Day et al., 2000; Ziesel et al., 2003). Operating ADPs in program spaces that have not been designed with persons with dementia in mind, such as multi-use community centres and churches, can potentially result in adverse effects as impaired cognition changes the way in which one interacts with his/her environment (Lawton & Nahemow, 1973).

Nova Scotia's ADPs were more commonly held in a community centre or a nursing home; however, ADPs held in institutional-based buildings were found to have significantly more design features that provide safety and security, autonomy and control, meaningful activities and reduce agitation and plan for wandering than ADPs held in community-based buildings. The differences found are most likely due to institutional-based buildings being designed for the cognitively impaired and having more access to resources. Design features such as secure doors, lockable storage rooms and paths for wandering were found to be more prevalent in institutional-based buildings.

Almost 60% of all ADPs were found to operate out of spaces that were 0-800 square feet. The Western Australia Department of Health (2007) recommended that:

Gross floor area varying from 400 to 500 sq. m is estimated as sufficient for about 30 to 45 service users. Preferably, about half or more of this space should be allocated to the main activity areas for clients, bearing in mind that adequate secure space has to be provided for clients who wander. The rest of the space should be used for the staff office, rooms for the assessment (if needed) of clients, special rooms (one or two) for clients to require more individual attention and/or particular nursing care, storage spaces and other facilities such as kitchen, toilets,

bath etc (p. 25).

As the majority of programs in Nova Scotia had 16 people or less (81%), the recommended size of program space according to these recommendations would be about 2,500 square feet; programs in Nova Scotia are being held in spaces that are less than half the recommended size. ADPs held in smaller spaces (0-800sqft) were found to have significantly less design features that highlight important stimuli and that provide good ‘visual access’ and afford functional independence for persons with dementia than ADPs held in larger spaces (1601+sqft). With 37% of ADPs having 2 or more rooms available for meaningful activities, the size of the majority of ADP spaces seems to be a limiting design feature in the ability of the programs to offer a choice of activities in separate rooms in order to reduce unwanted sensory and cognitive stimulation. “Our space allows for comfortable activity zones to accommodate different events at the same time. What isn’t perfect is that those zones don’t allow for privacy and can create an overall noisy environment – for example, if bingo is going on in one zone, hearing deficits mean it is loud all over” (ADP coordinator -church).

Nova Scotia’s ADPs were more likely to be supported with DHA/DHW funding (67%) than ADPs not supported with DHA/DHW funding and were more likely to be open for a full day at a fee to the user of \$0-\$15 (41%) or \$16-\$30 (33%) than ADPs open for half a day. ADPs that were supported with DHA/DHW funding, that were open for a full day and that were open for more than 2+ days a week (59%) were found to have significantly more design features that provide safety and security, functional independence, autonomy, control, meaningful activities and good ‘visual access’ for persons with dementia as well as provide spaces for their staff than ADPs that were not

supported with DHA/DHW funding(33%), that were open for a half day (22%) and that were open 1 day a week (41%).

Furthermore, ADPs that operate 6-8 hours a day (70%) had significantly more design features that provide safety and security, good 'visual access', functional independence and meaningful activities than ADPs that operate for 3-5hours a day (26%). ADPs that offered both activities and nursing/medical services were also found to have significantly more design features that provide meaningful activities, good 'visual access' and functional independence than ADPs that offered only activities.

ADPs that were in institutional-based buildings, were available more days per week, for more hours per day and offered more services in addition to activities, and had significantly more design features that support the needs of persons with dementia. Noticeably, these ADP characteristics were more commonly found in ADPs that were supported with DHA/DHW funding which could explain why ADPs that were supported with DHA/DHW funding scored significantly higher on 5 design principles than those ADPs not supported with DHA/DHW funding. ADPs that were not supported with DHA/DHW funding were found to operate less days a week, less hours per day and were located in community-based buildings, which were characteristics found to be significantly associated with lower design principle scores. These programs most likely share their space with other programs and are therefore not likely designed with cognitively impaired individuals in mind.

Although, the Department of Health's Continuing-Care Strategy (CCS) budgeted \$2-million to help set up or expand ADPs across Nova Scotia, and programs that are supported with DHA/DHW funding were found to implement more design features that

have been found from the literature to support the environmental needs of persons with dementia than ADPs not supported with DHA/DHW funding, equal importance should be placed on understanding how these programs are run, what type of environments they occur in and the personal and social relationships that evolve from attending these programs, in order to fully understand how ADPs are supporting the needs of the dementia participants and their caregivers.

A continuing gap in understanding ADP usage is whether the limited availability of these programs is due to lack of demand or lack of awareness/promotion; this is an important factor when considering the needs of caregivers. Persons with dementia, who need constant supervision, can attend ADPs during the day, allowing caregivers the opportunity to fulfill other work and family obligations; “caregivers frequently need more relief than the short breaks they receive when home care providers come to visit” (Health Council of Canada, 2012, p. 21). Services that “provide respite include day centres, short-term stay beds in long-term care facilities, and night care” (Health Council of Canada, 2012, p. 31). Although the majority of ADPs may operate 6-8 hours a day, providing a sufficient amount of time per day for caregivers to get some relief from their caregiving duties, with 41% of ADPs open 1 day a week and 26% open 2-3 days a week, caregivers are not given much choice or flexibility when considering respite options. An ADP coordinator from an ADP operating 4+ days a week mentioned “everyone thinks we are a stepping stone to nursing homes but most people who bring someone in with advanced dementia are so burnt out that this is their last resort while they wait for a spot in the nursing home, most people start here 1 day a week and end up coming 5 days a week”. This is consistent with the Canadian literature, in that the presence of cognitive

impairments was found to interact with caregiver burden in predicating ADP use (Baumgarten et al., 2002; Forbes et al., 2008; Ritchie, 2003; Savard et al., 2009). Low awareness levels of respite options contribute to stigmatization of programs and isolation for caregivers (WHO, 2012). The scarcity in awareness, promotion, funding and availability of ADPs for caregivers of persons with dementia in Nova Scotia needs to be further explored when considering respite solutions that allow the care recipient to remain in the home longer. Addressing identified barriers is critical in promoting these services to caregivers as well as using them as a cost-effective, supportive solution in reducing health care expenditures.

### **Areas for Future Studies**

Community support services have not been given much attention in the home care research or literature. At the most basic level, future researchers will be able to use the findings of this research study to expand on the limited knowledge of physical environment design in community care settings. The enormous range found in most of the items measured for even this small sample suggests the importance of future studies generating more detailed empirical data on the effects of environmental features in community-based services on the dementia population in order to determine the role of such community-based supports in the continuing care sector. Continued endeavours to standardize assessment, and improve 'quality of life' measures in community-based dementia care are needed. Other areas of research that would also help to facilitate policy development and improvement of care for persons with dementia include analyses of the impact of community support services in preventing decline.

### **Policy Implications**

The findings of this study can be used to inform decision makers about the ADPs being offered throughout the province of Nova Scotia, and the importance of acknowledging the design of the environment in community-based services when considering quality dementia care services and utilization patterns. As home care and community-based care continues to develop, now is the time to identify and redress the various gaps in our knowledge about these services in order to develop and target community-based services that more comprehensively meet the needs of the dementia population. A key component in meeting these needs requires the creation of suitable spaces. Providing standardized assessments, accreditation of dementia friendly services and initiatives to prioritise and improve dementia awareness, are essential as the life expectancy in the aging population increases ultimately resulting in higher percentages of individuals being diagnosed with dementia in need of care services (Fleming, 2011).

“Many countries, including Canada, spend more on long-term care than on home care” (Health Council of Canada, 2012, p. 17); the challenge to governments is to develop and improve services for people with dementia, focusing on earlier provision of support in the community, and a responsive health and social care sector (WHO, 2012). Developing dementia policies and plans involves looking at the state of current services and a critical analysis of current service provision, committing resources and increasing awareness. Canada’s bill for a national dementia strategy, Bill C-356, calls for incentives to encourage investment in dementia research, and to establish national guidelines for dementia care (Fletcher, 2011). The current omission of dementia from Canadian policies

may have serious consequences to the provision of adequate support and environmental interventions in practice.

To date, eight countries have created national Alzheimer's disease plans: Australia, Denmark, France, Japan, Korea, the Netherlands, Norway and the United Kingdom (England, Scotland, Wales and Northern Ireland). In Scotland, an accreditation system approved or endorsed by the Scottish Government ensures that services that wish to be described as “dementia-specific” adhere to a specified standard (Fleming and Forbes, 2009). It is recommended that a similar approach be taken in Nova Scotia’s community care sector. The development of environmental design standards could be undertaken in collaboration with the DHW and DHAs as well as recognized expert organizations in order to provide auditing and consultancy services. The availability of environmental assessment tools that are able to measure the quality of an environment against established and relevant principles provides an opportunity to assess services to determine if they are in fact being built with good design in mind. It is critical that those assessing care settings continue to work with those knowledgeable about the care implications of practical design features for persons with dementia. The ADPPEAT is a step in the right direction to assess how the physical design of the environment supports or hinders persons with dementia in a community-based setting; “your survey made me really think about the environment we program in and there are definitely items/noises that I never really considered before that could have an effect on the participants while they're here” (ADP coordinator – nursing home).

Additionally, lack of awareness of services, lack of understanding or stigma attached to the disease, previous poor experience with services, and cultural, language

and financial barriers creates obstacles to service utilization. Promotion of information and education for the public – including people with dementia, their caregivers and families – can improve service utilization by raising awareness, improving understanding and decreasing stigmatizing attitudes. In order to support the aging population in their own homes/communities, Nova Scotia must ensure that a broad range of support services that are designed to support the needs of the aging population are available, including respite care (WHO, 2012). This involves allocating resources to community-based services in the continuing care sector in order to increase availability and ensure quality support services. ADPs have been found to promote independence and maintain a person's physical and psychosocial well being, as well as that of their caregiver. In addition to practical support, these services also provide people with connections to their community, reducing their social isolation (Health Council of Canada, 2012, p.30).

### **Study Limitations**

The study has several limitations. First, the scales have been developed to measure specific ADP physical environment design features, although this simplifies ethics of the assessment of ADPs, it is a weakness in that there is no attempt to take into account the views of the clientele, the staff or the actual programming. Person-centred care philosophy is based upon the concept that all elements of the individual's life are incorporated; therefore this tool only addresses one of the many elements important to consider, therefore the findings of this study do not take into account other potentially influential components of ADPs in supporting the environmental needs of persons with dementia. However, the environment is an important element nonetheless in the care of persons with dementia and this tool was developed so that there will be a tool available

that addresses the environmental needs of persons with dementia when considering person-centred care research in the community care setting.

Second, recognizing the resource limitations of a master's thesis, the researcher was only able to crosscheck data in 4 ADP's, giving a mean percentage score for the inter-rater reliability. In future studies the inter-rater reliability of the tool should be further validated using the Cohen's Kappa statistic by increasing the sample size. Third, sample size was smaller than ideal, especially given the use of confirmatory factor analysis, as it may have contributed to failing to reject the null hypothesis (or "accept" the model) due to lack of statistical power (Type I error). However, other measures of fit were used to analyze the model fit, including the RMSEA and CFI that adjust for the issues of sample size inherent in the chi-squared test of model fit.

Fourth, there could potentially be other ADPs in the province of Nova Scotia that did not fill out the tool, in which the researcher was unaware of, which is a limitation to the sample selection and representativeness of the data. However, because these services are so heterogeneous, all known 27 ADPs were included in the study, which helped in reducing sampling error and maintaining a representative sample.

## **Conclusion**

Given the centrality of "home care" versus long-term care in sustaining the Canadian health care budget, the omission of attention to assessment in community service research is disappointing. In fact, "community support services have not been given much attention in the home care research or literature" (Health Care Council of Canada, 2012, p. 23). As our population ages, the number of people affected by Alzheimer's disease or a related dementia is going to increase dramatically; an estimated

500,000 Canadians have Alzheimer's disease or a related dementia and in just 5 years, as much as 50% more Canadians and their families could be facing Alzheimer's disease or a related dementia (Alzheimer Society of Canada, 2010). The majority of the elderly population in Canada lives at home and would like to remain there as long as possible. However, "a growing number need help from care services and family caregivers in order to manage daily activities and care for their health conditions" (Health Care Council of Canada, 2012, p.2). Seeing as almost half of the informal caregivers in Canada (43%) are between 45 and 54, many balance this role with job and family responsibilities. The need for availability in quality home and community care support services will increase dramatically in the years to come (Cranswick & Dosman, 2008). Identifying, promoting and evaluating community support services such as adult day programs are of utmost importance.

2012 marks the seventh-year in the ten-year Continuing Care Strategy in Nova Scotia, the goal of this research was to show the relative importance of the design in creating a dementia friendly physical environment in community-based services in order to support future policy decisions. Results of the study indicate that supporting ADPs with DHA/DHW funding may have an influence on how supportive the physical environment is for persons with dementia, as ADPs that were supported with DHA/DHW funding were found to have significantly more design features that support the environmental needs of persons with dementia than programs that were not supported with DHA/DHW funding. Future research would benefit from incorporating more analysis on the factors affecting the supportive environment (programming, staff-client-family- relationships) in adult day programs to capture a more holistic approach.

Given that adult day programs have the ability to provide a range of health, therapeutic recreational activities and social stimulation in supportive group settings, while offering health education for caregivers, these services have a great potential to be used to help the dementia population and their caregivers live at home for as long as possible and as independently as possible. Future strategies that provide financial support, promotion and resources to modify/ renovate adult day program environments will ultimately result in more suitably supporting the needs of persons with dementia and their caregivers. While awaiting more effective medical treatments, prevention strategies, and ultimately a cure, improving care and quality of life for those affected by dementia is of critical importance for future strategies (Alzheimer Society of Canada, 2010). The physical environment is an integral component of the quality of care provided in community support settings. Therefore, it is critical that careful consideration be given to how these environments are designed in order to promote health and well being among the growing dementia population (Brawley, 1997; Joseph, 2006).

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## Appendices

### *Appendix A. Adult Day Program Physical Environment Assessment Tool (ADPPEAT)*

#### **The Adult Day Program Physical Environment Assessment Tool**

This tool was developed for a study to determine what the characteristics are of Nova Scotia's adult day programs, with a specific focus on the physical environment features. This study is being done in partial fulfillment of the requirement for the degree of Master of Arts in Family Studies and Gerontology at Mount Saint Vincent University.

Identifying these areas and the various physical features present in Nova Scotia's adult day programs will help to provide as much detailed planning to meet the needs of our elderly population.

The following tool is broken down into design principles. Under each principle, items are listed for you to check off the ones that are most applicable for your adult day program.

All adult day programs that are willing to accept clients with early and/or late stages of dementia are invited to fill out this assessment tool. Completing the assessment tool is voluntary. The tool will take approximately 30 minutes of your time. The tool is to understand the design features of your adult day program. There are no right or wrong answers. You may choose not to answer all of the questions and may choose to withdraw from the study at any time without consequence. This assessment tool is for research purposes only.

The information you provide will be kept confidential and anonymous. Your name and personal information is not necessary for this study. The data collected will be analyzed and reported without identifying the specific adult day program. The retention of your completed answers will be governed in accordance with the approved application to Mount Saint Vincent University Research Ethics Board.

This research has been reviewed and approved by Mount Saint Vincent University ethics review boards. If you have any questions about how the research is being conducted, you may contact the Chair of the University Research Ethics Board (UREB) c/o MSVU Research Office at 457-6350 or via e-mail at [research@msvu.ca](mailto:research@msvu.ca).

**By completing this tool, you are consenting to the conditions outlined above.**

#### *Stage 1*

Please spend approximately 15-20 minutes slowly walking throughout the adult day program, noting the environmental features. Complete the tool below by checking the boxes of the appropriate responses or filling in the blanks.

If your program does not have the item, space or room asked about, check off the box N/A for Not Applicable when available.

*Stage 2*

Answer the two questions at the end of the assessment tool.

Thank you kindly for participating

Date:

Name of Program:

Time:

Location (City and/or Town):

<b>Details about the adult day program</b>					
1.	How many participants attend the program per day (at its fullest)?	10 or less	11-16	17-29	30+
2.	What types of clientele participate in the program?	Dementia clients only	Mix between dementia and non-dementia clients	Mostly non-dementia clients	No dementia clients
3.	What type of building is the program held in?	Community Centre	Church	Long-term care facility (i.e., nursing home)/ Hospital	Private Residence
4.	How many days per week is the program open?	0-1	2-3	4-5	6+
5.	What are the hours of operation per day	0-2hrs	3-5hrs	6-8hrs	9+hrs
6.	How much does the program charge for a full day?	N/A	\$0-\$15	\$16-\$30	\$31 +
7.	How much does the program charge for a half-day?	N/A	\$0-\$15	\$16-\$30	\$31 +
8.	Is the program provided public funding from the District Health Authority or the Department of Health and Wellness?	NO		YES	

9.	Is the program a standalone program or a part of a larger support network (i.e. Nursing home, VON, HomeInstead)?	Stand alone	Part of a larger network
10.	How long has the program been open for?	0-2 years	3-4 years
11.	What is the size of the space that the program is in?	0-800 Square feet	801-1600 Square feet
12.	What types of services are offered in the program? (check all that apply)	Nursing/Medical Services (Medication delivery, baths)	Therapeutic Services (Occupational, Music)

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<b>Spaces that are safe and secure</b>		<b>N/A</b>	<b>NO</b>	<b>YES</b>
If the program does not have the item, space or room asked about, check off the box N/A for Not Applicable.				
1.	Is the outdoor area secure? (i.e., are participants prevented from getting over/out/under the fence or gate without the assistance of a staff member)		0	1
2.	Is there program space dedicated solely to the adult day program? (i.e., the space is not shared with any other programs and is not used for purposes other than adult day services.)		0	1
3.	If the front door leads out of the facility is it secure? (i.e., monitored mechanically, electronically, or by staff surveillance)		0	1
4.	Are all side doors leading out of the facility secure?		0	1
5.	Are all exits visually discreet? (i.e., camouflaged, not easily seen)		0	1
6.	Are windows restricted so that participants cannot climb out?		0	1
7.	Is the outdoor area easily supervised from the point(s) where staff spends most of their time?		0	1
8.	Are all storage room doors lockable? (i.e., toxic substances locked away)		0	1
9.	If participants use the kitchen is there a lockable knife drawer in the kitchen?		0	1
10.	Are there smoke detection devices?		0	1
11.	If participants are involved in meal preparation are all the pots and pans small enough for them to lift easily?		0	1
12.	Are all floor areas safe from being slippery when wet (water)?		0	1
13.	All carpeting in areas is securely attached, and any exposed edges fastened to the floor?		0	1
14.	Is the common area easily supervised from the point(s) where staff spends most of their time?		0	1
15.	Are handrails accessible in all participant spaces?		0	1
16.	Are there call buttons in the bathrooms?		0	1

\_\_\_\_\_ ÷ 16 x 10 = \_\_\_\_\_  
 (Total score) (Score out of 10)

<b>Spaces that have good 'visual access' and afford functional independence</b>		<b>N/A</b>	<b>NO</b>	<b>YES</b>
If the program does not have the item, space or room asked about, check off the box N/A for Not Applicable.				
1.	Can the exit to the garden/outside area be seen from the area used as the lounge?  If there is more than 1 lounge room answer with reference to the one most used by persons with dementia.		0	1
2.	Can the dining room be seen into from the area used as the lounge room?  If there is more than 1 lounge room answer with reference to the one most used by persons with dementia.		0	1
3.	Can the kitchen be seen into from the area used as the lounge room?  If there is more than 1 lounge room answer with reference to the one most used by persons with dementia.		0	1
4.	Can the kitchen be seen into from the dining room?		0	1
5.	Can a toilet be seen from the dining room?		0	1
6.	Can a toilet be seen from the area used as a lounge room?  If there is more than 1 lounge room answer with reference to the one most used by persons with dementia.		0	1
7.	Are toilet room sizes large enough to allow staff to assist client and at least one can fit a wheelchair?		0	1
8.	Can the area(s) used as the lounge room be seen into from the point(s) where staff spends most of their time?  If there is more than 1 lounge room answer with reference to the one most used by persons with dementia.		0	1
9.	Are there landmarks (i.e, a distinctive plant or piece of wall art) located at junctures to facilitate way-finding?		0	1

$\frac{\text{Total score}}{9} \times 10 = \frac{\text{Score out of 10}}$

<b>Spaces that reduce unwanted stimulation</b>		<b>N/A</b>	<b>NO</b>	<b>YES</b>
If the program does not have the item, space or room asked about, check off the box N/A for Not Applicable.				
1.	Noises from outside the program space are noticeable?		1	0
2.	Is the noise from the kitchen distracting for the participants? (i.e., are staff contributing to the noise level by yelling at each other)		1	0
3.	Are deliveries (food, supplies) received in the areas where participants are? (i.e., common area, dining room)		1	0
4.	Is there a staff paging, or calling system in use that involves the use of loud speakers, flashing lights or bells etc?		1	0
5.	Do blinds or drapes on the windows remain completely shut during the day?		1	0
6.	Do tables, artwork, flooring, or surfaces give off a glare?		1	0
7.	Are there strong colour contrasts in the flooring? (i.e., checkmarks, swirls, patterns)		1	0
8.	Are hallways and entryways dark and poorly lit?		1	0
9.	Is more than one activity occurring in the same room at the same time (i.e., no dividers between activities)?		1	0
10.	Is the front entry easily visible to the participants?		1	0
11.	Is the service entry (where food is delivered) easily visible to participants?		1	0

$\frac{\text{Total score}}{11} \times 10 = \text{Score out of 10}$

<b>Spaces that highlight important stimuli</b>		<b>N/A</b>	<b>NO</b>	<b>YES</b>
If the program does not have the item, space or room asked about, check off the box N/A for Not Applicable.				
1.	Is the dining room clearly marked with a sign or symbol (i.e. picture of knife and fork)?		0	1
2.	Is the area used for the lounge room clearly marked with a sign or symbol?		0	1
3.	Is the kitchen clearly marked with a sign or symbol?		0	1
4.	Are toilets clearly marked with a sign or symbol?		0	1
5.	Do the colour of the toilet and the sink contrast with the colour of the walls and floors?		0	1
6.	Is there a lot of natural lighting in the lounge room? (Windows)		0	1
7.	Is the lighting in each area suitable for the activity taking place (brighter in the craft area than a conversational nook)?		0	1
8.	Is the lighting in the program space adjusted during the day?		0	1

\_\_\_\_\_ ÷ 8 x 10 = \_\_\_\_\_  
 (Total score) (Score out of 10)

<b>Spaces that reduce agitation and provide for planned wandering</b>		<b>N/A</b>	<b>NO</b>	<b>YES</b>
If the program does not have the item, space or room asked about, check off the box N/A for Not Applicable.				
1.	Is there a clearly defined and easily accessible path that guides the participant back to their starting point outside?		0	1
2.	Is there a clearly defined path that takes the participant around furniture and back to their starting point inside?		0	1
3.	Do the path(s) allow the participant to see into areas that might invite participation in an appropriate activity other than wandering?		0	1
4.	Are the path(s) within a secure perimeter?		0	1
5.	Can staff easily and discreetly survey the path(s)?		0	1
6.	Are there chairs or benches along the path(s) where people can sit?		0	1
7.	Is there signage for toilets provided along the path(s)?		0	1

\_\_\_\_\_ ÷ 7 x 10 = \_\_\_\_\_  
 (Total score) (Score out of 10)

<b>Spaces that are familiar</b>		<b>Many</b>	<b>A few</b>	<b>None</b>
1.	Are there any decorations that would not have been familiar to the majority of the participants when they were 30 years old? (i.e., very modern art)	0	0	1
2.	Are there any taps, light switches, door knobs, that are used by participants that are of a design that would not have been familiar to the majority of participants when they were 30 years old? (i.e., very modern)	0	0	1
3.	Are there any pieces of furniture in the common area or the dining room that are of a design that would not have been familiar to the majority of participants when they were 30 years old (i.e., chairs, sofas, lamps)?	0	0	1
4.	There is institutional equipment visible in the program space (i.e., nursing station)?	0	0	1

$$\frac{\text{Total score}}{4} \times 10 = \text{Score out of 10}$$

<b>Spaces that afford autonomy, independence and control</b>				
If the program does not have the item, space or room asked about, check off the box N/A for Not Applicable.				
1.	How many small/areas or rooms provide opportunities for conversational interaction or one-on-one activities?	None 0	1 0	2 or more 1
2.	How many rooms or areas are there to accommodate activities so that different activities may be chosen?	None 0	1 0	2 or more 1
3.	Are the spaces arranged in a “flexible manner” so that small group activities can be supported depending on the current needs?(i.e. quiet time room can change into a social time room)	N/A	NO 0	YES 1
4.	Does the dining area provide opportunities for participants to eat in small groups (2-4)?	N/A	NO 0	YES 1
5.	Are all dining room tables designed to seat less than six people in the dining area?	N/A	NO 0	YES 1
6.	Does the dining area provide opportunities for people to eat alone?	N/A	NO 0	YES 1
7.	Is there an area or room somewhat removed from the main dining room where families/caregivers can share meals with the participant?	N/A	NO 0	YES 1

$\frac{\text{Total score}}{7} \times 10 = \text{Score out of 10}$

<b>Spaces that afford meaningful activities</b>		<b>N/A</b>	<b>NO</b>	<b>YES</b>
If the program does not have the item, space or room asked about, check off the box N/A for Not Applicable.				
1.	The environment provides props that invite use (kitchen utensils, gardening tools, brooms, writing desks) that are associated with familiar, everyday activities?		0	1
2.	The props that are in the program reflect the preferences of the current participants?		0	1
3.	There are multiple activities among which participants may freely choose to participate?		0	1
4.	Furniture arrangements throughout the program are oriented to encourage conversation between two to three people?		0	1
5.	The furniture is usually never arranged in a large activity circle or in theater-style rows (unless for special occasions)?		0	1

\_\_\_\_\_ ÷ 5 x 10 = \_\_\_\_\_  
 (Total score) (Score out of 10)

<b>Spaces that meet the needs of staff</b>		<b>N/A</b>	<b>NO</b>	<b>YES</b>
If the program does not have the item, space or room asked about, check off the box N/A for Not Available.				
1.	Is there a room available just for staff?		0	1
2.	Is there a toilet area just for staff?		0	1
3.	Do the staff have their own lockers or change rooms?		0	1
4.	Can the outdoor area also be enjoyed by the staff		0	1
5.	Is there a room that can be used as a staff quiet room/-counselling room?		0	1

\_\_\_\_\_ ÷ 5 x 10 = \_\_\_\_\_  
 (Total score) (Score out of 10)

**Questions for feedback:**

1. On a scale of 1 to 10 provide your assessment of how useful this tool is in capturing **environmental design features** of an adult day program, that you see being important for persons with dementia? (Please Circle)

10 being very good at capturing and 1 being not good at all

Low					Moderate					High
1	2	3	4	5	6	7	8	9	10	

2. Are there any physical environment features and/or aspects of your adult day facility that you feel are missing from this assessment tool? If YES, please specify.

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3. Do you have any other comments?

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Thank you kindly for participating in this study and taking the time to complete this tool. Your participation in this research will help to produce more knowledge and awareness about Nova Scotia's adult day programs.

If you have any questions or concerns, please contact Thea Brown at [thea.brown@msvu.ca](mailto:thea.brown@msvu.ca)

*Appendix B. Letter of Introduction and Information to Adult Day Programs*

[DATE]  
[ADULT DAY PROGRAM NAME]  
[ADDRESS]  
[TELEPHONE NUMBER]  
[E-MAIL]

Dear [ADULT DAY PROGRAM Coordinator],

My name is Thea Brown and I am a student in the Master of Arts in Family Studies and Gerontology program at Mount Saint Vincent University. As part of my M.A., I am required to conduct a major project. This project, being conducted under the supervision of Dr. Janice Keefe, Professor and Canada Research Chair in Aging & Caregiving Policy, includes gathering information on adult day program physical environments in Nova Scotia and requires a coordinator to complete an assessment tool that asks multiple questions about the physical features of the design of the adult day program environment.

The importance of the physical environment has gained a higher profile in Nova Scotia's long-term care sector and because of this there have been initiatives in the province to create quality care environments in nursing homes and long-term care facilities. However, there is little knowledge available on community services such as adult day programs in Nova Scotia and the information you provide by filling out this assessment tool will help contribute to and build on that limited knowledge.

All adult day programs that are willing to accept clients with early and/or late stages of dementia are invited to fill out this assessment tool. Completing the assessment tool is voluntary. The tool will take approximately 30 minutes of your time. The tool is to understand the design features of your adult day program. There is no right or wrong answers. You may choose not to answer all of the questions and may choose to withdraw from the study at any time without consequence. This assessment tool is for research purposes only.

The information you provide will be kept confidential and anonymous. Your name and personal information is not necessary for this study. The data collected will be analyzed and reported without identifying the specific adult day program. The retention of your completed answers will be governed in accordance with the approved application to Mount Saint Vincent University Research Ethics Board.

A summary of the results from this research will be available from the researcher. A presentation on the outcomes and results of research will take place toward the end of the Winter 2012 semester. All are welcome to attend. An invitation to the presentation will be e-mailed to all participants.

This research has been reviewed and approved by Mount Saint Vincent University ethics review boards. If you have any questions about how the research is

being conducted, you may contact the Chair of the University Research Ethics Board (UREB) c/o MSVU Research Office at 457-6350 or via e-mail at [research@msvu.ca](mailto:research@msvu.ca).

If you are interested in partaking in this study or have any questions, please contact me at the above telephone number or e-mail address and you will be sent an assessment tool to complete by your preferred method (e-mail, fax or mail with a postage paid return envelope) or you may access the tool on-line at \*\*\*\*\*.

Sincerely,

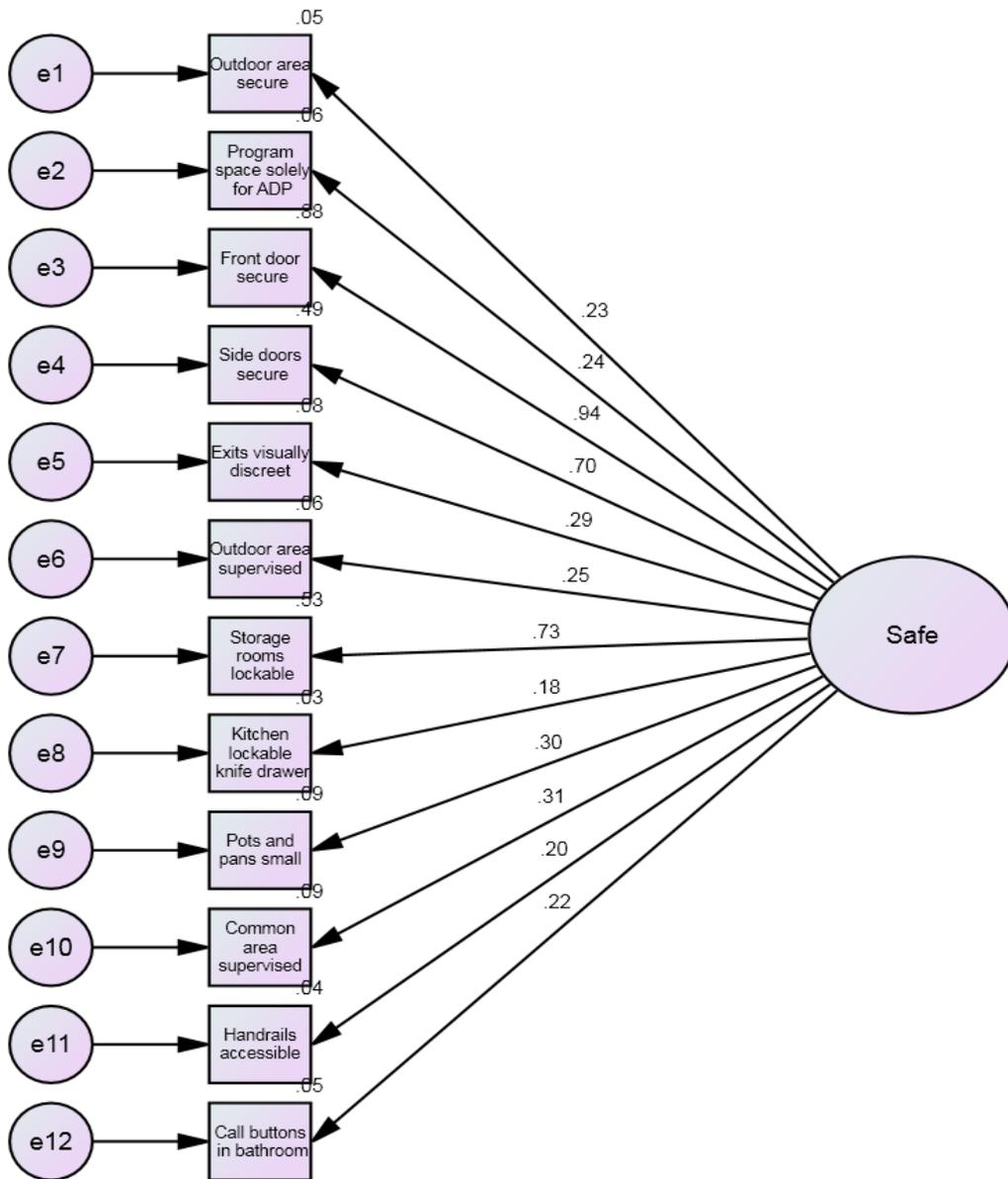
Thea Brown  
Department of Family Studies and Gerontology  
Mount Saint Vincent University  
166 Bedford Highway  
Halifax, Nova Scotia, B3M 2J6  
Tel. (902) \*\*\* - \*\*\*\*  
E-mail. [thea.brown@msvu.ca](mailto:thea.brown@msvu.ca)

*Appendix C. Re-tested Path Diagrams with Standardized Solutions*

Re-tested path diagrams with standardized solutions are presented. The one factor model for each of the nine sub-scales, where the latent variable is manifested by the nine observed variables is illustrated. The oval represents the latent variable and the rectangles represent the observed variables. The numbers on arrows from the latent variable to observed variables are the standardized factor loadings. The numbers on boxes of individual items (observed variables) are the squared multiple correlations that indicate the items percentage of variance accounted for by the relative latent variable (Albright & Park, 2008; Carmines & Zeller, 1979). Absolute and Relative fit indices presented are those after highlighted items in Table 3 were eliminated.

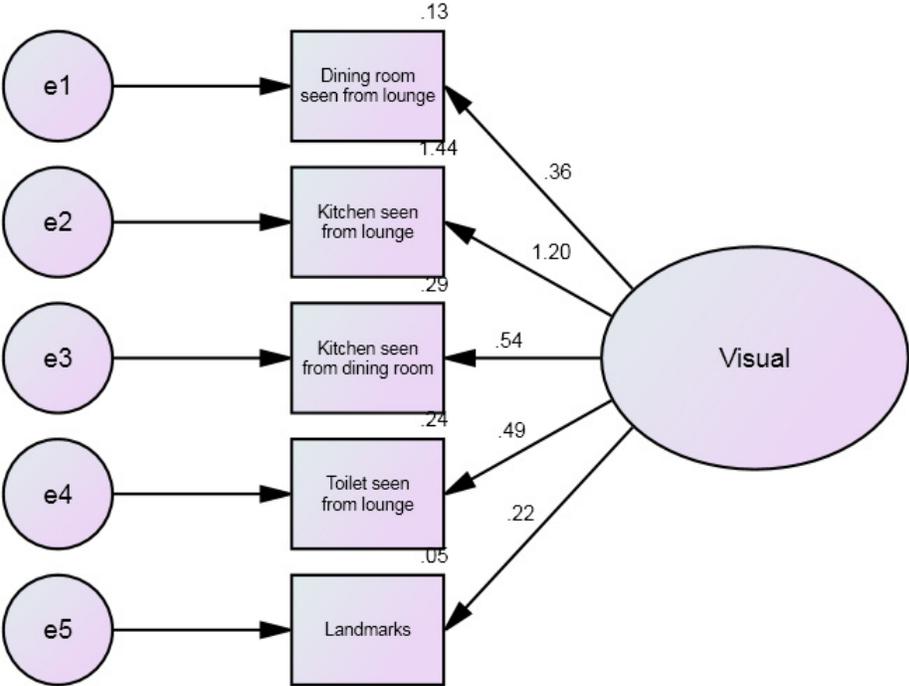
**Principle # 1**

**Spaces that are safe and secure (Safe)**



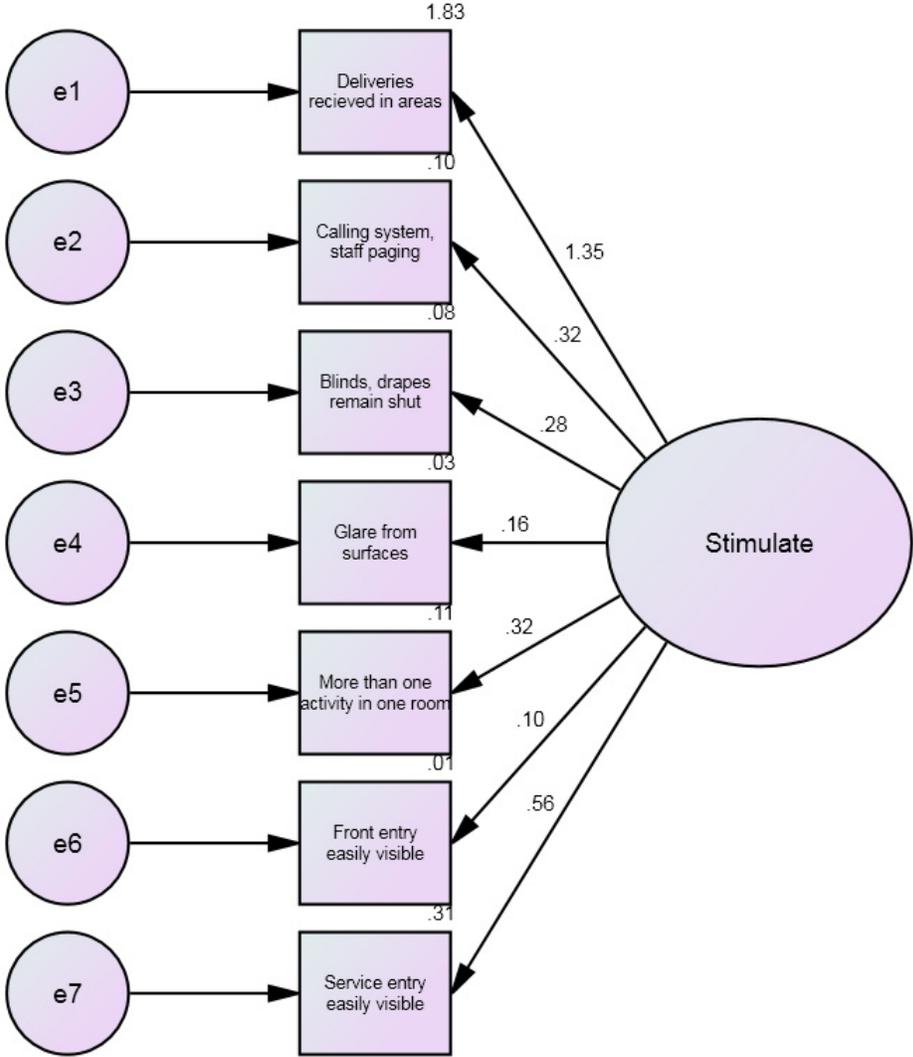
**Principle # 2**

**Spaces that have good 'visual access' and afford functional independence  
(Visual)**



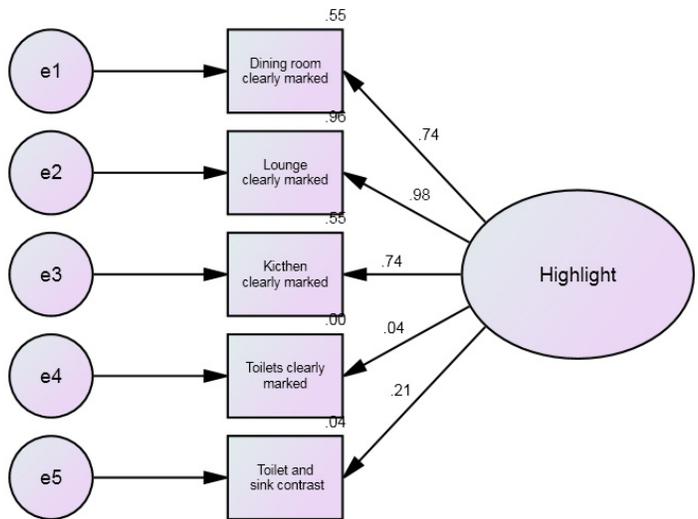
**Principle # 3**

**Spaces that reduce unwanted stimulation (Stimulate)**



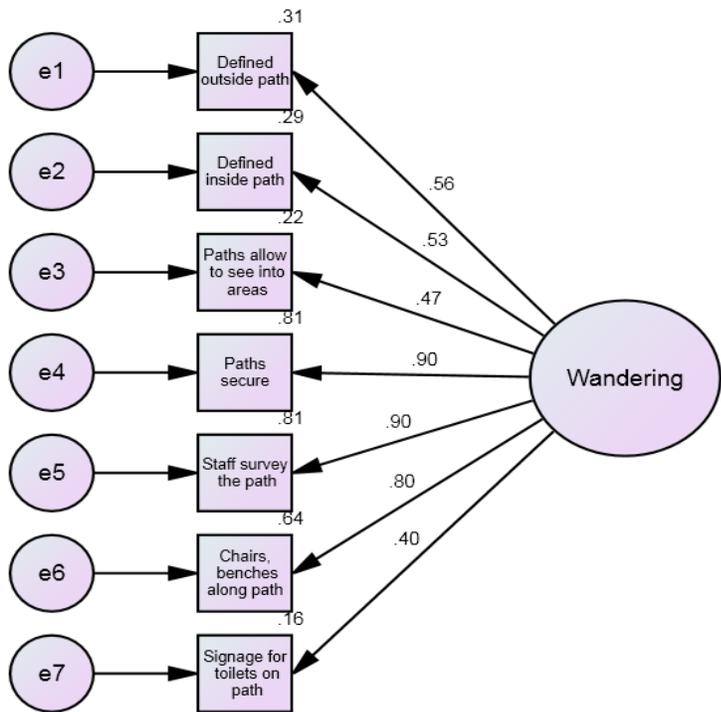
**Principle # 4**

**Spaces that highlight important stimuli (Highlight)**



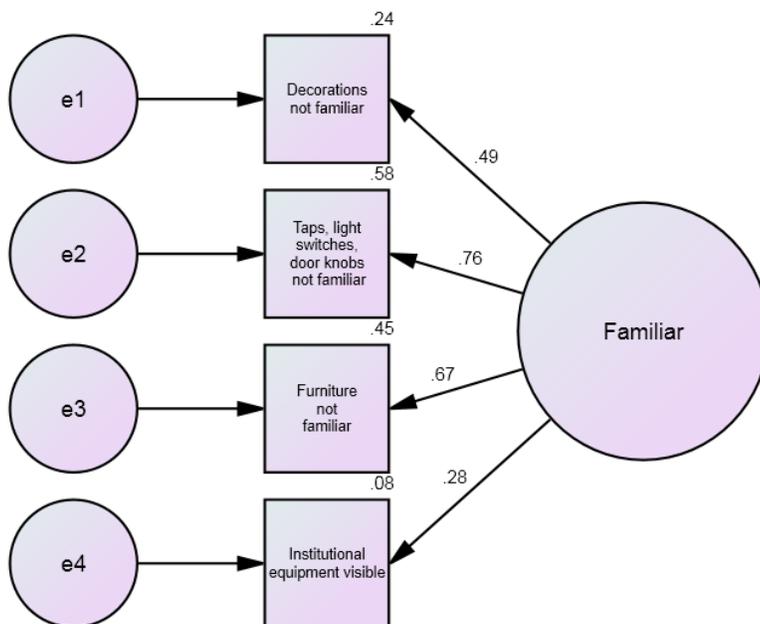
**Principle # 5**

**Spaces that reduce agitation and provide for planned wandering (Wandering)**



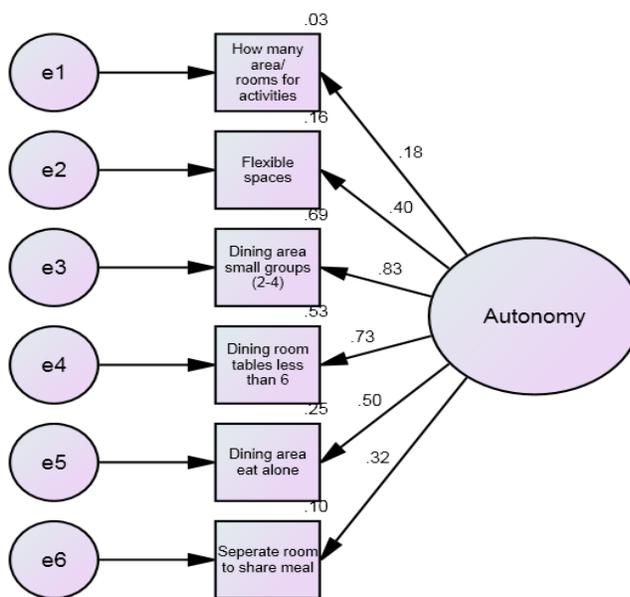
**Principle # 6**

**Spaces that are familiar (Familiar)**



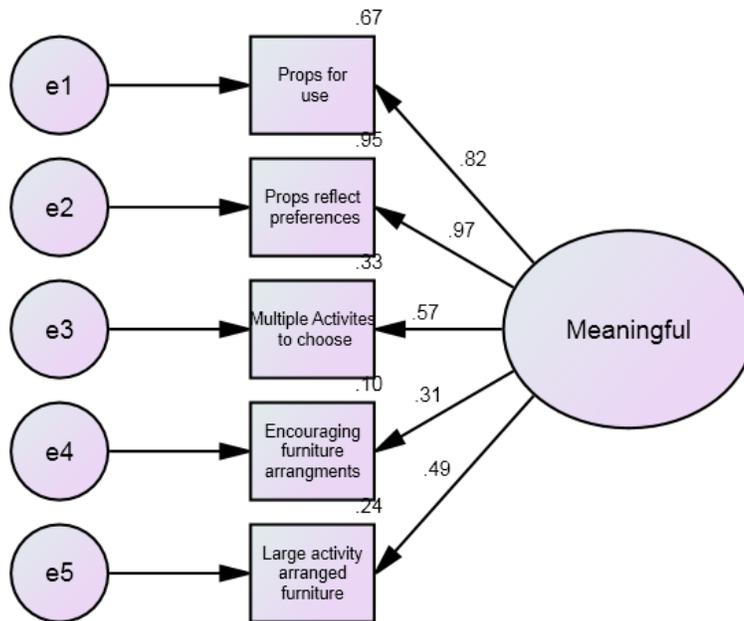
**Principle # 7**

**Spaces that afford autonomy, independence and control (Autonomy)**



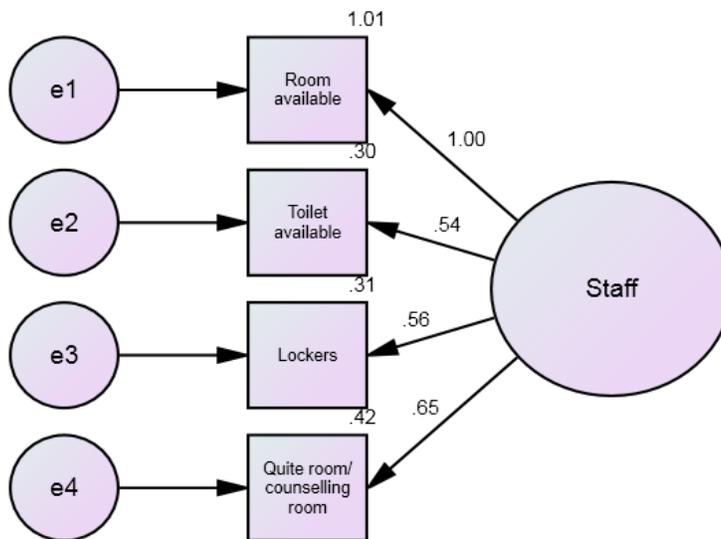
**Principle # 8**

**Spaces that afford meaningful activities (Meaningful)**



**Principle # 9**

**Spaces for staff (Staff)**



*Appendix D. Descriptive Statistics of the ADPPEAT Items*

Domain and Item Number	Item Description	% Of ADP That Have This Item	Distribution in sample	
			M	SD
<b>Spaces that are safe and secure</b>				
Saf1	Outdoor area secure	18.5%		
Saf2	Program space solely for ADP	40.7%		
Saf3	Front door secure	59.3%		
Saf4	Side doors secure	59.3%		
Saf5	Exit visually discreet	11.1%		
Saf6	Windows restricted	55.6%		
Saf7	Outdoor area supervised	40.7%		
Saf8	Storage rooms lockable	70.4%		
Saf9	Kitchen lockable knife drawer	11.1%		
Saf10	Smoke detection device	100%		
Saf11	Pots and pans small	22.2%		
Saf12	Floor area secure	66.7%		
Saf13	Carpeting secure	37.0%		
Saf14	Common area supervised	96.3%		
Saf15	Handrails accessible	25.9%		
Saf16	Call buttons in bathroom	44.4%		
SafTotal	Safety Total Score		4.17	2.19
<b>Spaces that have good 'visual access' and afford functional independence</b>				
Vis1	Exit to outside seen from lounge	40.7%		
Vis2	Dining room seen from lounge	59.3%		
Vis3	Kitchen seen from lounge	51.9%		
Vis4	Kitchen seen from dining room	51.9%		
Vis5	Toilet seen from dining room	33.3%		
Vis6	Toilet seen from lounge	37%		
Vis7	Toilet room sizes	92.6%		
Vis8	Lounge seen from staff	88.9%		
Vis9	Landmarks	48.1%		
VisTotal	Visually discreet Total Score		4.96	3.43
<b>Spaces that reduce unwanted stimulation</b>				
Stim1	Noise outside noticeable	44.4%		
Stim2	Kitchen noise distracting	18.5%		
Stim3	Deliveries received in areas	18.5%		
Stim4	Calling system, staff paging	40.7%		
Stim5	Blinds, drapes remain shut	3.7%		

Stim6	Glare from surfaces	18.5%		
Stim7	Colour contrasts in floor	0%		
Stim8	Hallways, entry dark	7.4%		
Stim9	More than one activity in room	33.3%		
Stim10	Front entry easily visible	33.3%		
Stim11	Service entry easily visible	25.9%		
Stim Total	Stimulus Reduction Total Score		6.46	2.18
<b>Spaces that highlight important stimuli</b>				
High1	Dining room clearly marked	3.7%		
High2	Lounge clearly marked	11.1%		
High3	Kitchen clearly marked	14.8%		
High4	Toilets clearly marked	66.7%		
High5	Toilet and sink contrast	74.1%		
High6	Natural lighting	81.5%		
High7	Activity lighting suitable	74.1%		
High8	Lighting adjustable	25.9%		
High Total	Highlight Stimuli Total Score		3.41	2.34
<b>Spaces that reduce agitation and provide for planned wandering</b>				
Wand1	Defined outside path	37.0%		
Wand2	Defined inside path	22.2%		
Wand3	Paths allow to see into areas	48.1%		
Wand4	Paths secure	48.1%		
Wand5	Staff survey path	55.6%		
Wand6	Chairs, benches along path	40.7%		
Wand7	Signage for toilets on path	22.2%		
Wand Total	Planned Wandering Total Score		4.07	3.47
<b>Spaces that are familiar</b>				
Fam1	Decorations not familiar	(none) 70.4%		
Fam2	Taps, light switches, doors knobs not familiar	(none) 74.1%		
Fam3	Furniture not familiar	(none) 70.4%		
Fam4	Institutional equipment visible	(none) 92.6%		
Fam Total	Familiar Spaces Total Score		7.69	2.94

Domain and Item Number	Item Description	% Of ADP That Have This Item	Distribution in sample	
			M	SD
<b>Spaces that afford autonomy and control</b>				
Auto1	How many area one-on-one	(2 or more) 29.6%		
Auto2	How many area for activities	(2 or more) 37.0%		
Auto3	Flexible spaces	70.4%		
Auto4	Dining area small groups (2-4)	48.1%		
Auto5	Dining room table less than 6	44.4%		
Auto6	Dining area eat alone	11.1%		
Auto7	Separate room share meal	7.4%		
Auto Total	Auto, Independence Total Score		3.64	2.62
<b>Spaces that afford meaningful activities</b>				
Mean1	Props for use	55.6%		
Mean2	Props reflect preferences	59.3%		
Mean3	Multiple activities	51.9%		
Mean4	Encouraging furniture arrang.	74.1%		
Mean5	Large activity arrang. furniture	29.6%		
Mean Total	Meaningful Activity Total Score		5.41	3.54
<b>Spaces for staff</b>				
Staff1	Room available	44.4%		
Staff2	Toilet available	29.6%		
Staff3	Lockers	18.5%		
Staff4	Outdoor area	55.6%		
Staff5	Quite room/counselling room	63.0%		
Staff Total	Staff Total Score		3.89	3.49

*Note.* Mean scores are after highlighted items were eliminated

*Appendix E. Crosstabs for DHA/DHW Funding*

<b>Adult Day Program (ADP) Characteristic</b>	<b>DHA/DHW Funding</b>	
	<b>No</b>	<b>Yes</b>
<b># of Clientele Per Day</b>		
10 or less	3	7
11-16	5	7
17-29	1	4
<b>Type of Clientele</b>		
Dementia only	0	2
Mix between dementia and non-dementia	8	14
Mostly non-dementia	1	2
<b>Building Type</b>		
Community-Based	8	7
Institutional-Based	1	10
<b># of Days Open Per Week</b>		
1	8	3
2-3	1	6
4+	0	9
<b>Hours of Operation/Day</b>		
3-5hrs	5	2
6-8hrs	4	16
<b>User fees for Full Day</b>		
\$0-\$15	1	10
\$16-\$30	2	7
<b>User fees for Half Day</b>		
\$0-\$15	9	10
\$16-\$30	0	1
<b>Support for Program</b>		
Part of Larger Network	0	2
Stand Alone	9	16
<b># of Years of Operation</b>		
0-2	1	2
3-4	2	9
5-6	2	2
7+	4	5
<b>Size of Space (in square feet)</b>		
0-800	8	8
801-1600	1	6
1601+	0	4
<b>Services Offered</b>		
Only Activities	5	5
Activities & Nursing/Medical	0	6
Activities & Therapeutic	3	1
Activities & Nursing/Medical & Therapeutic	1	6

*Appendix F. ADP Categorical Effects on Physical Environment Design Principles*

<b>Principles</b>	<b>Categorical</b>	<b>Values</b>	<b>n</b>	<b>M</b>	<b>SD</b>	<b>df</b>	<b>F</b>
<b>Safe and secure</b>	Building Type	Community -Based	15	3.22 <sub>a</sub> <sup>9</sup>	2.29	1,24	8.128**
		Institutional -Based	11	5.45 <sub>b</sub>	1.41		
<b>Autonomy and control</b>	Building Type	Community -Based	15	2.78 <sub>a</sub>	2.33	1,24	5.275*
		Institutional -Based	11	5.00 <sub>b</sub>	2.58		
<b>Meaningful activities</b>	Building Type	Community -Based	15	4.27 <sub>a</sub>	3.69	1,24	4.436*
		Institutional -Based	11	7.09 <sub>b</sub>	2.88		
<b>Planned wandering</b>	Building Type	Community -Based	15	3.05 <sub>a</sub>	2.90	1,23	4.425*
		Institutional -Based	10	5.86 <sub>b</sub>	3.78		
<b>Safe and secure</b>	# of days open per week	1	11	2.88 <sub>a</sub>	2.02	2, 24	4.309*
		2-3	7	5.48 <sub>b</sub>	1.26		
		4+	9	4.72 <sub>ab</sub>	2.82		
<b>Visual access</b>	# of days open per week	1	11	2.55 <sub>a</sub>	2.98	2, 24	8.389**
		2-3	7	5.42 <sub>ab</sub>	2.76		
		4+	9	7.56 <sub>b</sub>	2.40		
<b>Autonomy and control</b>	# of days open per week	1	11	2.12 <sub>a</sub>	1.98	2, 24	3.823*
		2-3	7	4.76 <sub>ab</sub>	3.10		

<sup>9</sup> Note. Means with differing subscripts within sections are significantly different at the  $p < .05$

\*  $p < .05$  \*\* $p < .01$

		4+	9	4.63 <sub>b</sub>	2.17		
<b>Meaningful activities</b>	# of days open per week	1	11	2.36 <sub>a</sub>	2.34	2, 24	13.616**
		2-3	7	7.14 <sub>bc</sub>	2.79		
		4+	9	7.78 <sub>bc</sub>	2.53		
<b>Staff</b>	# of days open per week	1	11	0.68 <sub>a</sub>	1.17	2, 24	18.657**
		2-3	7	5.71 <sub>bc</sub>	3.13		
		4+	9	6.39 <sub>bc</sub>	2.53		
<b>Safe and secure</b>	Hours of operation per day	3-5hrs	7	2.74 <sub>a</sub>	2.08	1, 25	4.561*
		6-8hrs	20	4.67 <sub>b</sub>	2.05		
<b>Visual access</b>	Hours of operation per day	3-5hrs	7	1.71 <sub>a</sub>	2.13	1, 25	12.032**
		6-8hrs	20	6.10 <sub>b</sub>	3.08		
<b>Meaningful activities</b>	Hours of operation per day	3-5hrs	7	2.00 <sub>a</sub>	2.31	1, 25	12.652**
		6-8hrs	20	6.60 <sub>b</sub>	3.12		
<b>Safe and secure</b>	User fee for a full-day	\$0-\$15	11	4.47 <sub>a</sub>	1.91	2, 23	8.447**
		\$16-\$30	9	5.56 <sub>a</sub>	1.56		
		N/A	6	1.81 <sub>b</sub>	1.70		
<b>Visual access</b>	User fee for a full-day	\$0-\$15	11	5.64 <sub>a</sub>	2.94	2, 23	10.257**
		\$16-\$30	9	7.11 <sub>a</sub>	2.67		
		N/A	6	1.00 <sub>b</sub>	1.67		
<b>Autonomy and control</b>	User fee for a full-day	\$0-\$15	11	3.94 <sub>a</sub>	2.61	2, 23	4.78*
		\$16-\$30	9	4.81 <sub>a</sub>	2.56		
		N/A	6	1.11 <sub>b</sub>	.86		
<b>Meaningful activities</b>	User fee for a full-day	\$0-\$15	11	6.18 <sub>a</sub>	2.89	2, 23	16.655**
		\$16-\$30	9	7.78 <sub>a</sub>	2.33		
		N/A	6	.67 <sub>b</sub>	1.03		
<b>Staff</b>	User fee for a full-day	\$0-\$15	11	6.36 <sub>a</sub>	2.59	2, 23	12.63**
		\$16-\$30	9	3.89 <sub>a</sub>	3.10		
		N/A	6	.00 <sub>b</sub>	.00		
<b>Safe and secure</b>	DHA/DHW funding	Yes	18	5.05 <sub>b</sub>	1.91	1,25	12.552**
		No	9	2.41 <sub>a</sub>	1.64		

<b>Visual access</b>	DHA/DHW funding	Yes	18	6.22 <sub>b</sub>	2.98	1, 25	9.672**
		No	9	2.44 <sub>a</sub>	2.96		
<b>Autonomy and control</b>	DHA/DHW funding	Yes	18	4.54 <sub>b</sub>	2.59	1, 25	8.02**
		No	9	1.85 <sub>a</sub>	1.94		
<b>Meaningful activities</b>	DHA/DHW funding	Yes	18	6.89 <sub>b</sub>	2.59	1, 25	14.245**
		No	9	2.44 <sub>a</sub>	3.43		
<b>Staff</b>	DHA/DHW funding	Yes	18	5.56 <sub>b</sub>	3.04	1, 25	22.50**
		No	9	.56 <sub>a</sub>	1.10		
<b>Visual access</b>	Size of Program Space (sqft)	0-800	16	3.38 <sub>a</sub>	2.99	2, 24	5.743**
		801-1600	7	7.14 <sub>b</sub>	2.27		
		1601+	4	7.50 <sub>b</sub>	3.78		
<b>Highlight important stimuli</b>	Size of Program Space (sqft)	0-800	16	3.75 <sub>a</sub>	1.91	2, 24	5.868**
		801-1600	7	1.42 <sub>b</sub>	1.51		
		1601+	4	5.50 <sub>a</sub>	3.00		
<b>Visual access</b>	Types of services	Only Activities	10	3.4 <sub>a</sub>	3.13	2, 23	5.824**
		Activities & Nursing	6	8.67 <sub>b</sub>	1.03		
		Activities & Therapeutic	4	2.5 <sub>a</sub>	2.52		
		Activities & Nur & Ther	7	5.43 <sub>ab</sub>	3.20		
		Only Activities	10	2.00 <sub>a</sub>	3.43		
<b>Meaningful Activities</b>	Types of services	Only Activities	10	2.00 <sub>a</sub>	3.43	2, 23	4.901**
		Activities & Nursing	6	8.33 <sub>b</sub>	2.33		
		Activities & Therapeutic	4	4.50 <sub>ab</sub>	3.79		
		Activities & Nur & Ther	7	6.86 <sub>ab</sub>	1.95		
		Only Activities	10	2.00 <sub>a</sub>	3.43		