Can Better Outdoor Environments Lead to Cost Benefits in Assisted Living Facilities Through Increased Word-of-Mouth Referrals?

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Abstract

Objective: This study explores how better outdoor environments may produce cost benefits for assisted living providers by raising occupancy levels through increased resident satisfaction and word-of-mouth referrals.

Background: Older adults who spend even minimal time outdoors may reap substantial health benefits. However, many existing outdoor areas in assisted living facilities are reportedly underutilized, in part because of design issues. Providers may be more willing to improve outdoor areas if they produce cost benefits for provider organizations.

Methods: This study used data from a recent assisted living survey to assess the relationship between satisfaction with outdoor spaces, time spent outdoors, and resulting improvements in mood. A financial analysis was developed to estimate potential benefits from improved outdoor areas attributable to increased occupancy and decreased marketing costs associated with increased word-of-mouth referrals.

Results: Increasing resident satisfaction with outdoor areas (from approximately 29% to 96%) results in residents spending more time outdoors (increase of 1½ hours per week per resident) and improved psychological well-being (12% increase in feeling better). This greater overall satisfaction leads to 8% more residents willing to refer potential residents to their community. Because word-of-mouth referrals by current residents are a major factor in resident recruitment, improving outdoors areas leads to an estimated 4% increase in new residents, resulting in over $170,000 of increased revenue per year for a community of 100 residents.

Conclusions: Improved outdoor space can provide substantial cost benefits for assisted living providers. Increasing resident well-being and satisfaction, and thereby generating additional word-of-mouth referrals, can result in higher occupancy levels.

Keywords: *Outdoor environments, assisted living, cost benefits, resident satisfaction, occupancy levels, seniors, rental income, word-of-mouth referral*

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Introduction

The Growing Importance of Supportive Environments for Seniors

In 2011, the first post-WWII baby boomers turned 65, marking the beginning of the larg-

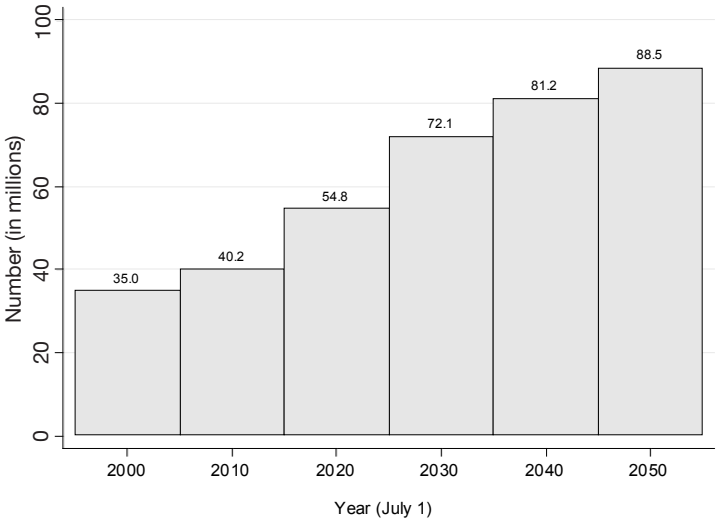

Figure 1. U.S. Population aged 65 and over, actual and projected, by year.

Source: Projections of the Population by Age and Gender for the United States: 2010 to 2050 (NP2008-T12), Population Division, U.S. Census Bureau; Release Date: August 14, 2008.

est population explosion of older adults in U.S. history. The number of persons aged 65 and over is projected to increase from the current level of 40 million to about 72 million by the year 2030, according to the U.S. Census Bureau (Figure 1). Over the coming years, it is expected that increasing numbers of supportive residential facilities will be needed, because of the continued decline in health and functional ability that typically occur during the aging process.

Assisted living is a residential option that has grown rapidly in the past few decades as an appealing alternative to nursing facilities, partly because it places greater emphasis on homelike atmosphere and personal autonomy for older adults (Regnier, 2002). The popularity of the recent "culture change" movement demonstrates the increasing preference of the new wave of consumers for "person-centered" environments that emphasize quality-of-life issues (Koren, 2010). With an average length of stay of nearly 2½ years (Adler, 2009), the quality of the physical environment in assisted living has a powerful long-term influence on the lives of residents. Because many residents spend most of the day, nearly every day, in the same facility environment, to a great extent this environment determines what residents are (or are not) able to do, during a significant portion of the remaining years of their lives. For this reason, it is of paramount importance to adequately support the basic functional and psychosocial needs of residents, and make certain that no major requirements are overlooked.

The Health Value of Outdoor Environments

Even in facilities that conscientiously strive to provide a supportive environment, one important need of residents that is often overlooked is the opportunity to be able to spend time outdoors in safety and comfort. Several studies have found that the majority of residents express a strong desire to have access to usable outdoor space, and features such as "green, landscaped grounds," and outdoor places for "enjoying nature, talking with friends, and looking at plants" are ranked among the most important aspects of a retirement community (Browne, 1992; Keane, Cislo, & Ful-

"How can we motivate senior housing providers to justify the expense of designing, constructing, and maintaining supportive outdoor areas needed for health-promoting outdoor activities for their residents?"

ton, 2003; Stoneham & Jones, 1997; Talbot & Kaplan, 1991). In addition, recent studies have found important health benefits for older adults who spend even small amounts of time outdoors. Such benefits include increased physical activity, better Vitamin D absorption, improved mood, reduced stress, and increased longevity, leading to the conclusion that spending time outdoors is a vital resource for remaining healthy in old age (Berrigan & Troiano, 2002; Godbey & Blazey, 1983; Holick, 1995; Humpel, Owen, & Leslie, 2002; Lavizzo-Mourey & McGinnis, 2003; Netz, Wu, Becker, & Tenenbaum, 2005; Takano, Nakamura, & Watanabe, 2002).

In spite of substantial health benefits, outdoor space is typically reported as being *underutilized* in existing facilities (Heath & Gifford, 2001; Hiatt, 1980; Regnier, 1985), often for reasons related to environmental design. This calls attention to the value of applying evidence-based design methods to develop more successful outdoor environments and raises the question, "How can we motivate senior housing providers to justify the expense of designing, constructing, and maintaining supportive outdoor areas needed for health-promoting outdoor activities for their residents?"

The Economic Value of Outdoor Environments

It is generally thought that when baby boomers reach retirement age and consider the prospects of moving into supportive housing, their expectations will be far more demanding than those of preceding generations. In long-range planning for this looming market, and within budget constraints, housing and care providers will need to decide which investments are most likely to pay off. Different aspects of the physical environment have different price tags and different levels of impact on attracting residents to a given community, and keeping them satisfied while living there. A study by Mather Lifeways (Keane, Cislo, & Fulton, 2003) found that in dementia-market assisted living, outdoor activity space was considered almost as important as the top-ranked overall feature, which was described as physical supports such as handrails and walking surfaces. *The Independent Living Report* sponsored by the American Seniors Housing Association (Wylde, 2009) found that the *appearance of the outdoor space* ranked second only to the *location of the community* as the most important environmental feature in their study. The concept of using outdoor areas to add value is already reflected in the marketing materials used by many senior communities. Brochures and websites commonly depict residents strolling or relaxing in elegant

outdoor areas, surrounded by flowers, greenery, and attractive views. This idealized lifestyle depiction is likely to appeal especially to baby boomers seeking retirement housing in the future, and also seems to have broad appeal to current retirees' adult children, who commonly assist in the selection of housing alternatives.

Far from being a frill, usable outdoor space may be one of the most cost-effective ways to upgrade an existing facility, and to ensure that a new facility will be positively viewed by residents and visitors. However, to the authors' knowledge, no previous studies have addressed the potential financial benefits of supportive outdoor environments in assisted living facilities. The purpose of this paper is to fill this gap in the literature by exploring the contribution that effectively designed outdoor space can make, not only to the perceived quality of life for residents, but also to the financial performance of the facility in terms of rental income due to higher occupancy levels from increased word-of-mouth referrals (Figure 2).

Methods

To compare the quality of outdoor environments with levels of outdoor usage and resident satisfaction, 68 assisted living facilities were selected from Houston, TX; Chicago, IL; and Seattle, WA. They represent three of the 10 major emerging megapolitan regions of the United States (Lang & Dhavale, 2005), with diverse geographic and climatic conditions. In each region, study facilities were randomly selected from the list of all certified assisted living facilities with more than 50 nondementia residents located within a two-hour driving distance from the urban core. This resulted in a sample that included facilities located in contexts ranging from urban and suburban, to outlying communities, all with a fairly large number of nondementia assisted living residents. All residents were considered eligible to participate, and were invited to participate in a survey about their preferences at "assisted living communities," with no special emphasis placed on outdoor issues. Informed consent of the residents was obtained through staff members, and confidentiality was used to protect the rights of human subjects. This study was approved by a university institutional review board. The 1,140 participating residents had a mean age of 84.1, ranging from 42 to 104, with 77.9% women.

A written survey was administered by a team of visiting researchers, consisting of 44 questions (some multiple-choice and some write-in). In addition to basic demographic data, the survey collected information from residents about preferences, usage, and activities related to the

Figure 2. Flowchart of factors relating satisfaction to outdoor space and occupancy levels.

outdoors. The issues relevant to the analysis presented in this paper included the following questions on resident satisfaction and response to outdoor space:

1. "How much do you like the outdoor areas here at this senior community?" Possible responses: Not at all, somewhat, or very much.
2. "After spending time outdoors, how do you usually feel?" Possible responses: Worse than before, same as before, or better than before.

Responses from the above two questions were dichotomized into "very much" and "other," and "better than before" and "other."

To evaluate the amount of time spent outdoors, residents were asked about the frequency and duration of their outdoor usage:

3. "How often do you typically use the outdoor areas here at this senior community, when the weather is nice?" Possible responses: Never, seldom or almost never, every month, twice a month, every week, every day, or more than once a day.
4. "If you use the outdoor areas here at this senior community, about how long do you usually stay outdoors, on average, when the weather is nice?" Possible responses: Five minutes or less, about 15 minutes, about 30 minutes, about 45 minutes, about one hour, about 1½ hours, or 2 hours or more.

Responses from the two questions were combined to derive the number of outdoor minutes per week per resident. This two-step approach was found in pre-testing to be conceptually easier and more accurate than asking residents to estimate their total outdoor minutes per week. Staff responses on surveys asking them to estimate levels of resident outdoor usage were overall comparable with resident responses.

Residents were also asked about their satisfaction or dissatisfaction with specific outdoor features, with the following questions that each allowed *open-ended write-in responses*, which were later grouped into categories:

5. "How hard is it for seniors to see and reach the outdoor areas here at this senior community?" Possible responses: Very hard, somewhat hard, somewhat easy, or very easy. If hard, please say why.
6. "How physically comfortable is it for seniors to spend time in the outdoor areas here?" Possible responses: Very uncomfortable, partly comfortable, or very comfortable. Why?
7. "What do you like best or least about being outdoors at this senior community?"
8. "If you could add one thing to the outdoor areas here, what would you add?"

For Questions 1 and 2, logistic regression was used to estimate the strength of the relationship between responses to the two questions. For Questions 3 and 4, linear regression was used to estimate the average amount of time spent outdoors. A fourth-root transformation of time spent outdoors was used to improve normality of residuals, which was verified by visual inspec-

A business case, incorporating rate structure and marketing costs, was developed comparing an assisted living facility with poor outdoor areas to one with excellent outdoor areas.

tion of a box plot. Robust clustered standard errors were used to adjust for probable correlations between respondents at the same facility. Confidence intervals (CI), at the 95% level, are reported. In the case of functions of model coefficients, standard errors are calculated using the delta method. For Questions 5–8, the Satisfied and Dissatisfied write-in responses were combined to form mutually exclusive categories of summary responses.

A business case, incorporating rate structure and marketing costs, was developed comparing an assisted living facility with poor outdoor areas to one with excellent outdoor areas. The poor and excellent designations were based respectively on the 5th percentile and the 95th percentile of *resident satisfaction*, from the answers to Question 1 above.

A broad-based Gallup survey found "customer recommendations were more effective than any form of paid advertising" (Finkelstein, 2006, p. 18), and marketing studies in senior housing have found current residents are "the most effective referral sources and that people referred by residents and their families have a longer length of stay" (Martin, 2008, p. 30). Wylde (2010) confirmed that word-of-mouth referrals do generate a substantial portion of new residents, and estimated that, depending on the age of the facility, 14% to 41% of current residents *had moved there because of a word-of-mouth referral from a current resident*. Given that there are other important factors, such as location and cost, we conservatively estimated that an increase in willingness of current residents to give referrals would result in half that size increase in the number of new residents.

The marketing budget for an assisted living facility has been estimated to be between $1,275 and $1,775 per unit per year (National Investment Center, 2010), an average of $1,525 per unit per year. We estimate that management at a facility experiencing an increase in new residents would decrease the marketing budget by $1,525 per new resident. According to the National Investment Center for the Seniors Housing and Care Industry, the estimated average rent/service fee at assisted living facilities in the United States in the second quarter of 2010 was $3,525 per unit per month, which is $42,300 per unit per year (NIC MAP® Data & Analysis Service, 2010).

Results

Environmental Features Related to Outdoor Satisfaction

Survey findings revealed that residents were dissatisfied with many aspects of existing outdoor areas. Table 1 shows that residents most commonly complained about seating, doorways, and walkways, when asked (a) what they liked the

Table 1. Percent of Responses Showing Resident Satisfaction and Dissatisfaction with Existing Features of the Outdoor Areas in Assisted-Living Facilities

	Dissatisfied			**Satisfied**	
	N	**Percent**		**N**	**Percent**
Seating	75	46.3%	Seating	147	39.6%
Doorways	31	19.1%	Nature Elements	84	22.6%
Walkways	22	13.6%	Walkways	52	14.0%
Enough space	16	9.9%	Adequate shade	31	8.4%
Adequate shade	15	9.3%	Enough space	29	7.8%
Nature Elements	3	1.9%	Doorways	28	7.6%
Total	**162**	**100%**	Total	**371**	**100%**

least overall, (b) what made the area easy or hard to reach, and (c) why the area was comfortable or uncomfortable.

Similarly, previous focus groups and surveys have found that residents' dissatisfaction with outdoor areas tends to concentrate on four main aspects: (a) doorways that are hard to get through, (b) unsafe or poorly designed walkways, (c) inadequate seating, and (d) lack of shade (Rodiek, 2006, 2008, 2009). In this study, on-site observation suggested that the cost of rectifying many of the elements that residents are dissatisfied with, such as door adjustment, improved seating, provision of shade, and maintenance and repair of walkways, would be well within the normal maintenance budget of most facilities, or with the addition of a modest annual capital budget.

In facilities with relatively successful outdoor areas, residents typically expressed satisfaction with several features, as shown in Table 1. Interestingly, the same features that were described as *unsatisfactory* at some facilities were reported as being *highly satisfactory* at facilities where they apparently had been designed with the needs and preferences of residents in mind. This finding emphasizes the importance of the location, layout, and detailed design of these features. Seating, walkways, shade, and doorways appear prominently in comments showing satisfaction with outdoor areas; in addition, nature elements, social spaces, adequate space, and freedom of movement also appear to be important.

In addition to critiques of existing facilities, residents also expressed a desire to have specific improvements added to their outdoor environment (Figure 3). Aside from swimming pools, which are expensive to build and maintain, their "wish lists" mainly included ordinary features that were criticized as poorly designed or deficient at certain facilities. Most of these could be remedied through the use of existing annual maintenance budgets or through the addition of a modest annual capital investment of perhaps $5,000 per facility. Based on the four features most often

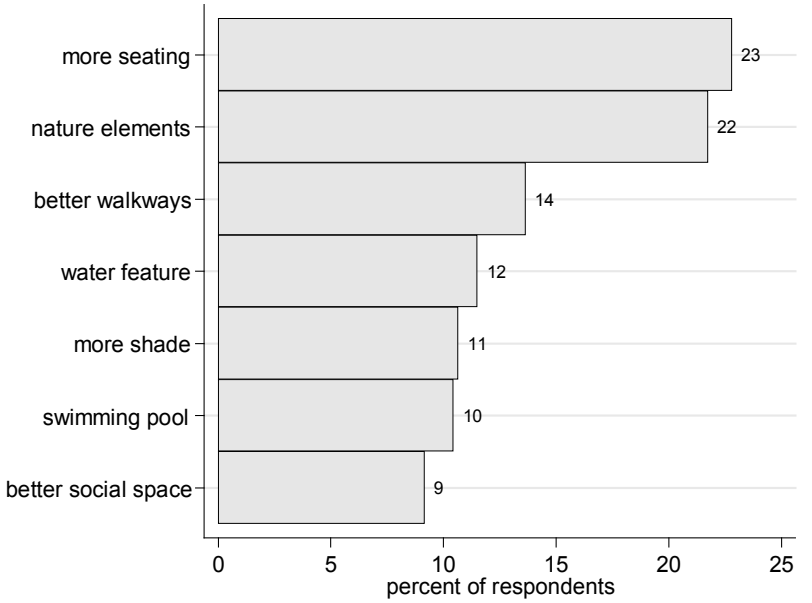

Figure 3. Features residents would most like to add to existing outdoor spaces.

described as problematic (doorways, unsafe walkways, inadequate seating, and lack of shade), a rough estimate was made for a "typical" facility: doorway closing mechanisms might be adjusted for $100 or less, or an automatic opener could be installed for $1,000–$4,000, depending on type. Problems with a few walkway sections that had shifted might be repaired or replaced for $500–$2,000, depending on extent. Outdoor seating could be provided or improved for about $100–$800 per bench or chair, and shade could be added by a small patio awning, an arbor with vines, or trees, at a cost ranging from $100 to $10,000. The needs and options would depend on existing conditions at each facility, but outdoor improvements could be completed in stages, and are generally less expensive than indoor renovations, as well as being less disruptive to facility routines.

Outdoor Satisfaction Related to Mood, Facility Satisfaction, and Referrals

Logistic regression revealed a strong relationship between resident satisfaction with outdoor areas and feeling better after being outdoors, as expected (Model 1, # observations = 1036, # clusters = 66, p value < 0.001). More precisely, 74.6% (95% CI: 71.2–78.0%) of residents who were very satisfied with the outdoor spaces felt better after being outside, compared to only 55.9% (95% CI: 50.2–61.6%) of those who liked the outdoor areas only somewhat or not at all. This relationship was not affected by age and gender, meaning that for any age and gender, satisfaction with the outdoors was related to feeling better after being outdoors (p values were 0.6 and 0.3, respectively). Both higher satisfac-

Both higher satisfaction with outdoor areas and better feeling after being outdoors correlated with spending more time outdoors, by almost two hours.

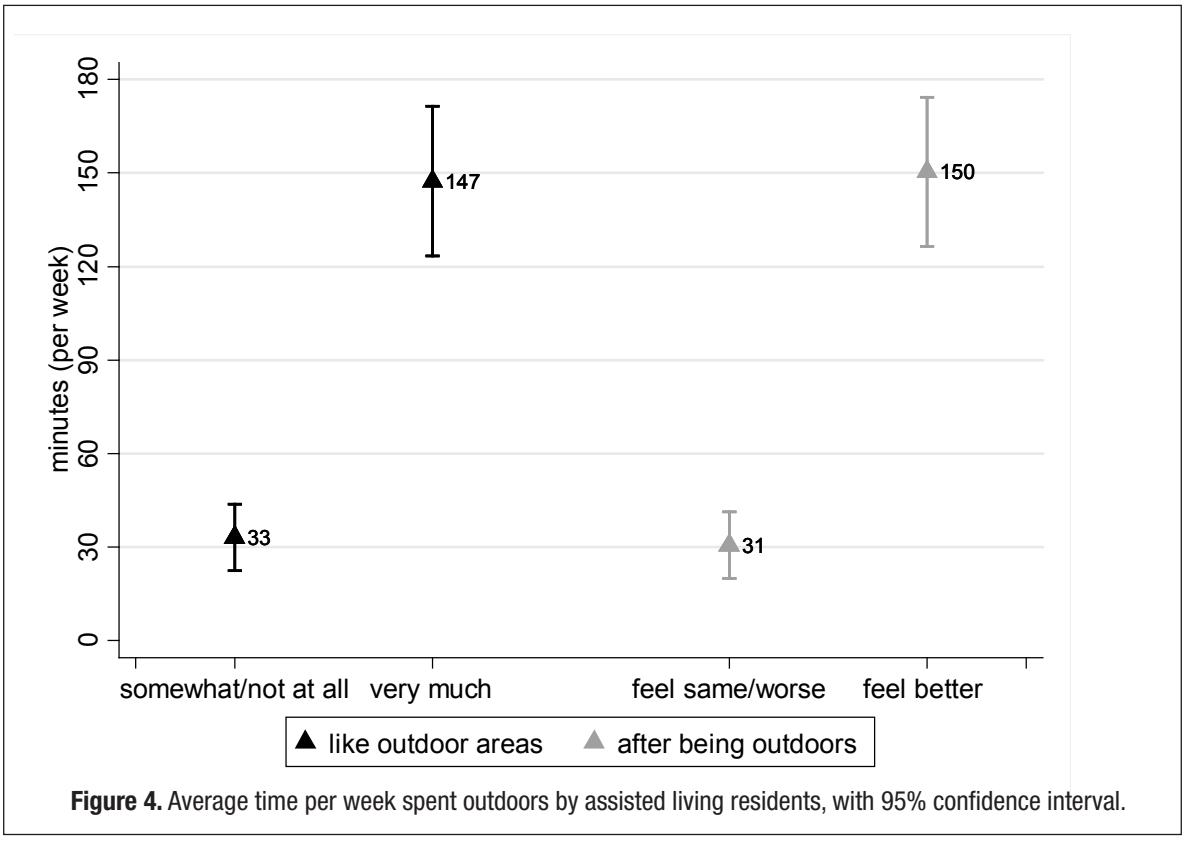

Figure 4. Average time per week spent outdoors by assisted living residents, with 95% confidence interval.

tion with outdoor areas and better feeling after being outdoors correlated with spending more time outdoors, by almost two hours. Linear regression (Model 2, # observations = 1,002, # clusters = 65, p value < 0.001) showed that, on average, a resident who was very satisfied with the outdoor spaces spent 147 minutes (95% CI: 123–171 min.) outdoors each week, whereas a resident who was somewhat or not at all satisfied spent only 33 minutes (95% CI: 22–44 min.) outdoors each week. This relationship was unaffected by age (p value = 0.3), and even though females tended to be less satisfied with the outdoors (p value = 0.002), the relationship between satisfaction and time outdoors was the same for men and women (interaction p value = 0.5). In other words, for both men and women, increasing satisfaction with the outdoors was linked to increasing amounts of time outdoors. The second linear regression model (Model 3, # observations = 1,003, # clusters = 66, p value < 0.001) showed that, on average, a resident who felt better after being outdoors spent 150 minutes (95% CI: 126–174 min.) per week outdoors, whereas a resident who felt the same or worse after being outdoors spent only 31 minutes (95% CI: 20–41 min.) outdoors each week (Figure 4). As in Model 2, age had no impact (p value = 0.6) and though gender mattered (p value < 0.001), the interaction was insignificant (p value = 0.4).

Business Case

The results from statistical analyses can be used to construct a business case highlighting the financial benefits of improving outdoor spaces at an assisted living facility. Let SO = "very satisfied with outdoor spaces" and FB = "feel better after being outdoors." Then FB = 0.746*SO+0.559*(1-SO) (Equation 1), since of those who were very satisfied with the outdoor spaces, 74.6% felt better after being outdoors and of those who were not very satisfied with the outdoor spaces, only 55.9% felt better after being outdoors. Therefore, by increasing the proportion of residents who are satisfied with the outdoor spaces from 0% to 100%, management could increase the proportion of those who feel better after being outside from 55.9% to 74.6%.

Wylde et al. (2010; Wylde, Smith, Schless, & Bernstecker, 2009) showed that very satisfied residents are far more willing or likely (97%) to refer others to their community than simply satisfied residents (31%). In other words, let VS = "very satisfied with facility" and WR = "willing to refer others." Then WR = 0.97*VS+0.31*(1-VS) (Equation 2), since of those who are very satisfied with their facility 97% are willing to refer others to their community and of those who are less satisfied with their facility only 31% are willing to refer others to their community. Therefore, by increasing the proportion of residents who are very satisfied with their facility from 0% to 100%, management could increase the proportion of those who are willing to refer others to their community from 31% to 97%.

Sikorska (Sikorska, 1999; Sikorska-Simmons, 2001) found a strong positive correlation between psychological well-being and facility satisfaction (r = 0.53; p value < 0.01). Combining this with the above two facts, we deduce that assisted living facilities can increase word-of-mouth referrals from current residents by improving the quality of their outdoor spaces. More precisely, by substituting VS in the second equation with FB in the first, we have WR = 0.123*SO+0.679 (Equation 3). This means that by increasing the proportion of current residents who are very satisfied with the outdoor spaces from 0% to 100%, management could increase the proportion of current residents who are willing to refer others to their community from 67.9% to 80.2%.

Ranking facilities with regard to the average response to Question 1, the median facility has 66% of residents very satisfied with the outdoor spaces. A facility at the 5th percentile has only 29.41%, and a facility at the 95th percentile has 95.65% of its residents who are very satisfied with the outdoor spaces. Table 2 contains a projection of resident-benefits and cost-benefits for a facility with 100 residents that improves its ranking from the 5th to the 95th percentile position; benefits are accrued through higher occupancy levels and reduction in marketing costs. Increased time spent outdoors is estimated from Model 2 (row 2 in Table 2) and increased well-being, that is percent of residents feeling better after being outdoors (row 3) is estimated from Model 1. The percent of current residents who are willing to refer others to their community (row 4) is calculated using row 3 and Equation

Table 2. Increase in Annual Income due to Increased Referrals from Residents with High Outdoor Satisfaction

	Poor (5th percentile)	**Excellent** (95th percentile)	**Increase**
Percent of current residents who are very satisfied with the outdoor spaces	29.41%	95.65%	66.24%
Average time spent outdoors per resident in minutes per week (95% CI)	55 mins (43-67)	140 mins (118-163)	85 mins (66-104)
Percent of current residents who feel better due to outdoor usage (95% CI)	61.85% (58-66)	73.90% (71-77)	12.05% (8-16)
Percent of current residents who are willing to refer others to their community (95% CI)	71.82% (69-74)	79.77% (78-82)	7.95% (5-11)
Percent of new residents per year from referrals (95% CI)	35.91% (35-37)	39.89% (39-41)	3.98% (2.6-5.4)
Savings from reduction in marketing budget, per 100 residents at $1,525 per resident per year (95% CI)			$6,062 (3,921-8,203)
New referred residents annual rent, per 100 residents at $42,300 per resident per year (95% CI)			$168,151 (108,767-227,534)
* Exact totals may not agree due to rounding.		**TOTAL** (95% CI)	**$174,213** ($112,689-235,737)

3, and by halving, we obtain row 5. Estimated yearly savings from reduction in marketing budget for a 100-unit facility are shown in row 6, and annual rent savings are shown in row 7. Rows 6 and 7 are then totaled to give the final row of total savings.

The results of this study show that increasing resident satisfaction with outdoor areas from 29.41% to 95.65% results in residents spending more time outdoors (increase of 1½ hours per week per resident) and improved psychological well-being (increase of 12% in feeling better). This increase in the overall satisfaction level leads to 8% more residents being willing to refer potential residents to their community. Since word-of-mouth referrals from existing residents constitute a very important resource

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for recruiting new residents (Groff & Giorgio, 2008; Wylde, 2009, 2010), improving outdoor areas can generate an estimated increase of 4% in new residents, resulting in over $170,000 of increased revenue per year for a community of 100 residents.

Conclusions

In spite of the acknowledged value and appeal of usable outdoor areas where residents can enjoy spending time (while improving their physical health and psychological well-being), many facilities tend to concentrate their landscape efforts on ornamental landscaping, rather than developing functional spaces residents can actually use. In addition, although evidence-based information is available on how to design outdoor areas that support residents' needs (Cooper Marcus & Barnes, 1999; Regnier, 2002; Rodiek, 2009), this information is not always effectively applied. Rodiek and Lee (2009) found that many new, relatively affluent facilities had outdoor design-related problems that residents were aware of, and were dissatisfied with.

The failure of existing facilities to fully meet residents' desires for supportive outdoor space is somewhat understandable, because the importance of outdoor space is often overshadowed by indoor space and program issues. However, because outdoor space is typically less expensive than indoor space, improving the quality of outdoor space can be a cost-effective way to improve *the overall quality of the facility, and how it is perceived by potential residents and their families*. In addition to increased occupancy levels, it is possible that improved outdoor space can produce added cost benefits by stimulating the growth of housing rent, especially as rent growth has slowed during the recent economic period (NIC MAP® Data & Analysis Service, 2010), while many expenses have continued to climb. The industry-wide prediction is that retiring baby boomers will expect highly satisfactory residential environments, and market forces will drive the demand for supportive, enjoyable outdoor space that promotes health and well-being as far into old age as possible.

Fortunately, it is not necessarily difficult or expensive to improve existing outdoor areas, or to design and construct new outdoor areas that support residents' needs. Problems with outdoor space often stem from simple issues that could be avoided by proper planning, or could be remedied fairly inexpensively after the fact. For example, a door that is hard to open may only need to be adjusted so the overhead door closer requires less opening force. Alternatively, perhaps the threshold just needs to be replaced with a flatter profile that can be more easily navigated with a wheelchair or walker. Uncomfortable seating can be improved by adding cushions, and additional seating may be installed so residents will not be forced to walk very far to reach a place where they can rest. Shade can be provided by a variety of inexpensive shade structures, including trees and vines. Existing walkways can be repaired to meet, and preferably exceed, current accessibility standards.

Site visits undertaken as part of this study revealed that many facilities spent substantial sums of capital investment in developing decorative landscaping to do nothing more than improve curb appeal. Unfortunately, some of those same facilities neglected to develop usable outdoor areas that might have encouraged physical activity, and helped residents maintain a sense of connection with the world beyond the facility walls. Even without major changes, these situations could be improved by adding more walkways to connect existing areas, and allowing residents to reach some of the ornamental trees, shrubs, and flower beds that are currently inaccessible to them, as most residents will not stray off paved walkways.

Using existing maintenance budgets to address the dissatisfaction residents have expressed with outdoor areas (as detailed in Table 1) and their desires for improvements (as detailed in Figure 3), could potentially result in over $170,000 of increased revenue per year for a community of 100 residents. Even if an additional annual capital investment of $5,000 were made to secure this increased annual revenue, the net revenue increase of $165,000 per year constitutes a very healthy return on investment and cost benefit to the assisted living facility operator. By using evidence-based design to develop creative solutions to environmental situations, assisted living management can tap into the additional revenue made possible by improved outdoor space, while at the same time potentially improving the health, well-being, and quality of life of elderly residents.

Limitations of Study and Further Research

Because of a scarcity of precedents, the assumptions made in this financial projection were conservative, and assumed that marketing budget decreases at half the rate of new residents. Additional research on the effect of improved resident well-being on occupancy rates and marketing budgets would enable estimates to be calculated more definitively.

The mean age of 84.1 (slightly lower than the reported national assisted living mean age of 86.9, Byala, 2009) and the survey recruitment based on self-selected voluntary participation may have impacted the results, because slightly younger, more active people are generally more likely to participate in voluntary activities. However, the very old were fairly well represented in this study, with 280 of the 1,140 residents (about 25%) being over 90, and ten of the participants being 100 years or older. Study participants were 77.9% women, compared with the national average of 73.6% women. This is likely due to men being somewhat less likely to participate in voluntary activities. Despite slight differences compared to the national average, our participants included sufficient representation of both genders and a wide range of age groups. Further, participants were not aware of the specific study focus during the recruitment, which helped to reduce the potential selection bias.

Information was collected on whether residents grew up in urban, suburban, small towns, or rural areas; no significant association was

found with resident satisfaction or level of outdoor usage. The study also examined whether facilities had existing horticultural therapy or on-site outdoor activity programs; although outdoor activity programs were associated with somewhat higher levels of outdoor usage and walking, neither type of programmed activity was associated with resident satisfaction with outdoor areas.

This study examined only one pathway by which improved outdoor space could provide cost benefits. Further research might explore several other pathways that could potentially result in additional cost benefits, including:

- Reduced incidence and severity of falls, due to increased levels of exercise and physical activity by residents who spend more time outdoors;
- Improved overall health and well-being, due to exposure to bright outdoor light levels reducing depression and increasing Vitamin D absorption;
- Reduced rates of cognitive decline or early-stage dementia, due to higher physical activity levels and improved mood;
- Reduction in staff time and stress levels due to improved resident mood and well-being, associated with spending more time outdoors;
- Reduced staff burnout because of increased staff use of outdoor areas for relaxation, exercise, and respite from job-related stress;
- Reduced demands on staff time by residents who receive increased support from family members and friends, due to improved outdoor environments for visitors; and
- Improved resident quality of life through increased social support and connection with other residents from outdoor socializing.

Thus, this study has, if anything, underestimated the potential benefits to be gained by assisted living facilities from improving the quality of their outdoor spaces, to make them more resident-friendly. This should serve as an indicator to the storehouse of positive effects, economic and health-related, waiting to be tapped.

Implications for Practice

- The real estate value and level of resident satisfaction of assisted living communities can be significantly increased through modest investments in the accessibility to, and quality of, outdoor living spaces and natural areas.
- The capital improvements to, recurring maintenance of, and management of outdoor living spaces do not require exorbitant expenditures, but instead require careful alignment with resident needs.
- The four main areas that draw resident dissatisfaction are doorways that are difficult to use, walkways that are unsafe or poorly designed, seating that is inadequate or uncomfortable, and outdoor areas that lack shade.
- If resident satisfaction is maximized with relatively modest investments in resolving the problems described above, then assisted living communities should see a reduced number of vacancies and increased income, resulting in a significantly improved financial return on investment for the owners and operators of these real estate assets.

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