

A study on the lifestyle characteristics of older adults in Datong city and their implications for the spatial design of community-based elderly care centers

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ABSTRACT

China's rapidly ageing population has increased demand for community-based elderly care facilities that support daily living, health promotion, social participation, and ageing in place. Yet many facilities are still designed through standardized functional templates that pay insufficient attention to local routines, cultural memory, and patterns of social interaction. This study examines how the lifestyle characteristics of older adults in Datong City, Shanxi Province, can inform the spatial design of community-based elderly care centers. An exploratory qualitative case-study approach was adopted, combining structured site surveys, non-participant behavioral observation, semi-structured interviews, and documentary analysis. The evidence was organized through thematic analysis and cross-source comparison. The findings identify six interrelated lifestyle patterns: regular and seasonally adjusted daily rhythms, preference for hot and familiar northern Shanxi foods, short-distance walking-based mobility, acquaintance-oriented social interaction, continued family and intergenerational roles, and strong attachment to local cultural memories. These patterns affect facility location, circulation, temporal use of rooms, dining and health-service provision, informal social nodes, environmental identity, and the balance between digital and human services. The study proposes seven design strategies: flexible time-sharing layouts, continuous age-friendly details, networks of informal social spaces, dining spaces that combine nutrition and social support, integrated rehabilitation and health-promotion areas, contemporary translation of local culture, and dual-track smart and human service interfaces. The results provide a localized design framework for community-based elderly care facilities in Datong and comparable medium-sized northern Chinese cities.

Keywords: Datong City, older adults' lifestyles, community-based elderly care centers, interior design, ageing in place, regional adaptation.

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INTRODUCTION

Population ageing has become a central issue for social governance, public-service provision, and urban renewal in China. By the end of 2025, China had 323.38 million people aged 60 years and above, accounting for 23.0% of the total population (National Bureau of Statistics of China, 2026). At the same time, smaller household sizes, intergenerational separation, residential mobility, and the increasing prevalence of empty-nest and disability-related care needs have placed growing pressure on the traditional family-centered model of later-life support. Community-based elderly care has therefore become an

important bridge between ageing at home and institutional care.

Community-based elderly care centers are embedded service facilities that may provide meal assistance, day care, health monitoring, rehabilitation, cultural and recreational activities, nursing consultation, psychological support, and opportunities for social interaction. Their value is not determined only by the number of rooms or services offered. It also depends on whether older residents can reach the facility easily, recognize its functions, use it safely, and integrate it into their ordinary

routines. Previous research has shown that older adults' service priorities, neighborhood conditions, and facility characteristics influence both the use of community care services and the frequency with which particular functional spaces are visited (Xiang et al., 2019; Wen et al., 2024).

Despite this growing body of research, three gaps remain relevant to spatial design. First, many studies identify general service needs or measure neighborhood accessibility, but give less attention to how stable daily routines are translated into the temporal organization of interior spaces. Second, design recommendations are often presented as universal age-friendly standards, while the influence of local climate, food culture, industrial history, and acquaintance-based social networks receives limited analysis. Third, research on major metropolitan areas is more visible than research on medium-sized northern cities, where cold winters, older work-unit neighborhoods, and strong local cultural memories can shape facility use in distinctive ways. These gaps may contribute to a mismatch between technically compliant facilities and spaces that older residents are actually willing to enter, remain in, and use repeatedly.

A lifestyle perspective offers a way to address this mismatch. Lifestyle is not merely a collection of personal preferences; it is a relatively stable configuration of practices shaped by social position, accumulated experience, family structure, culture, and place (Bourdieu, 1984). For older adults, long-established routines and place attachments may become especially important because familiar environments support autonomy, identity, security, and continuity (Rowles, 1983; Wiles et al., 2012). Consequently, the design of community-based elderly care centers should respond not only to physical decline but also to habitual time use, preferred foods, social relationships, family roles, and local cultural identity.

Datong provides a meaningful case for such analysis. The city is located in northern Shanxi and combines the characteristics of a historical and cultural city with those of a resource-based industrial city undergoing transformation. Long cold winters, traditional northern Shanxi foodways, work-unit residential legacies, close neighborhood relations, and prominent heritage resources such as the Yungang Grottoes and the ancient city have contributed to a locally recognizable pattern of later-life experience. The case is therefore useful for examining how regional lifestyles can be translated into concrete spatial decisions rather than treated as decorative cultural themes.

Accordingly, this study asks two questions: (1) What recurring lifestyle characteristics can be identified among older adults in Datong City? and (2) Through what mechanisms should these characteristics influence the spatial organization and interior design of community-based elderly care centers? The study follows the analytical sequence of lifestyle characteristics, spatial needs, and design strategies. Its contribution lies in connecting qualitative evidence about everyday life with a

localized and operational design framework for community-based elderly care facilities.

THEORETICAL FRAMEWORK AND METHODS

Lifestyle, person-environment fit and active ageing

The theoretical framework integrates lifestyle theory, environmental behavior theory, the ecological model of ageing, and active ageing. Bourdieu (1984) explains lifestyle as an embodied system of dispositions expressed through everyday practices, tastes, and patterns of participation. This perspective is valuable because it directs attention from abstract demographic categories to the repeated practices through which older adults organize meals, mobility, family responsibilities, social interaction, and leisure.

Environmental behavior theory emphasizes reciprocal relationships between people and physical settings. Barker's (1968) concept of behavior settings suggests that recurring activities are associated with identifiable combinations of people, spatial arrangements, and temporal patterns. Lawton and Nahemow's (1973) ecological model further proposes that well-being depends on the fit between personal competence and environmental demands. In elderly care facilities, excessively long circulation routes, abrupt level changes, poor lighting, unclear wayfinding, or inflexible room arrangements may increase environmental pressure. Conversely, accessible routes, recognizable landmarks, resting opportunities, and adaptable spaces can support autonomy and participation.

Active ageing provides the normative orientation of the study. The World Health Organization (2002) frames active ageing around health, participation, and security, while its age-friendly city guidance stresses the importance of accessible outdoor spaces, transportation, social participation, respect, communication, and community support (World Health Organization, 2007). These principles imply that a community-based elderly care center should not be conceived only as a place of passive care. It should also function as a neighborhood platform for social life, preventive health, cultural participation, and intergenerational connection.

Research design and evidence sources

The study adopted an exploratory qualitative case-study design. Evidence was drawn from structured site surveys of community-based elderly care settings and surrounding public spaces in Datong, non-participant observation of activity patterns at different times of day, semi-structured conversations with older residents and relevant service personnel, and documentary materials concerning ageing, time use, nutrition, community care, and age-friendly

design. The spatial survey focused on layout, entrances, circulation, facility configuration, places where older adults stayed, apparent barriers to use, and the relationship between indoor spaces and nearby community routes.

The original fieldwork also used a structured questionnaire as a prompt for discussing daily routines, dietary habits, travel, health management, social interaction, cultural preferences, and spatial needs. However, the materials available for the present article did not constitute a complete participant-level numerical database that could support reproducible descriptive or inferential statistics. To avoid presenting unverifiable percentages, means, or group comparisons, the revised study treats the questionnaire items as structured qualitative prompts and reports only patterns supported by cross-source evidence. This clarification corrects the quantitative overstatement in the earlier manuscript and aligns the claims with the documented evidence.

Analytical procedure and trustworthiness

The qualitative materials were analyzed thematically. First, observation notes, interview summaries, and structured field survey records were repeatedly reviewed to identify statements and behaviours related to time, diet, mobility, social interaction, family roles, health, technology, and cultural identity. Second, similar codes were grouped into broader lifestyle themes. Third, each theme was compared with spatial observations and relevant literature to identify its likely design implications. Finally, the themes were organized into a lifestyle-space matrix that links recurring practices with location, circulation, functional configuration, environmental atmosphere, and service-interface decisions.

Trustworthiness was strengthened through source triangulation rather than statistical generalization. A pattern was treated as analytically meaningful when it recurred across more than one type of evidence, such as observation and interview summaries, or when local evidence was consistent with established findings from community care and ageing-in-place research. Negative or limiting cases were retained in the interpretation; for example, digital services may be convenient for younger older adults but can create barriers for people with low digital literacy. The findings should therefore be understood as a localized design-oriented interpretation rather than a representative population survey.

RESULTS: REGIONAL LIFESTYLE PATTERNS OF OLDER ADULTS IN DATONG

The analysis identified six interrelated lifestyle patterns. They are presented separately for clarity, but in everyday life they overlap. Daily rhythm affects when meals and activities are needed; mobility influences whether services

can be reached; social and family roles shape the kinds of shared spaces that are acceptable; and cultural memory affects whether a facility feels familiar or institutional.

Regular and seasonally adjusted daily rhythms

Older adults in the field materials generally organized daily life around relatively regular routines. Morning exercise, household errands, meal preparation, midday rest, afternoon socializing, and evening family life formed a recurring sequence. National time-use evidence provides a broader context: among participants aged 60 years and above, discretionary personal activities averaged 5 hours and 22 minutes per day, and the participation rate was 98.7% (National Bureau of Statistics of China, 2024). These national figures do not replace local evidence, but they support the observation that many older adults have stable periods available for community activities.

Datong's climate modifies this rhythm. During cold and windy winters, early-morning and evening outdoor activity may be delayed or reduced, increasing reliance on warm, accessible indoor places. In warmer seasons, morning walks and outdoor exercise become more prominent. The local pattern is therefore not simply "early to bed and early to rise"; it is a regular schedule adjusted to temperature, daylight, and walking conditions. Spatially, this pattern creates different peaks of use: light exercise and consultation in the morning, meal and rest needs around midday, and social and cultural activities in the afternoon.

Preference for hot, familiar, and regionally recognizable foods

Dietary practices were characterized by regular meals, preference for hot food, and strong familiarity with northern Shanxi grain and noodle products. Knife-cut noodles, oat-flour products, bean-flour noodles, buckwheat noodles, steamed foods, and mixed-grain foods were repeatedly associated with home-style taste and regional identity. Older adults also expressed practical concerns about chewing, digestion, salt, sugar, temperature, and portion size. The Chinese Dietary Guidelines emphasize dietary diversity, appropriate energy intake, and reduced salt and oil consumption, which are particularly relevant to meal services for older adults (Chinese Nutrition Society, 2022).

The significance of food extended beyond nutrition. A meal resembling familiar home cooking could reduce the institutional feeling of a care facility, while shared dining could provide low-threshold social contact for people living alone. Thus, food culture functions simultaneously as a health issue, a daily time anchor, and a source of emotional continuity. Table 1 summarizes the regional grain-based foods retained from the original manuscript and standardizes their labels and source note.

Table 1. Representative grain-based foods associated with older adults' dietary practices in Datong.

Flour category	Main ingredients	Typical texture or taste	Nutritional/regional meaning	Representative foods	Appearance
Wheat flour	Wheat flour	Chewy elastic and	Fine-grain traditionally associated hospitality	staple with Knife-cut noodles, sliced noodles, hand-pulled noodles	
Oat flour	Oats	Fragrant, slightly coarse, and firm	Cold-resistant widely used in northern Shanxi	Oat-flour kaolao lao and oat-flour rolls	
Bean flour	Peas, mung beans, or other legumes	Dense, sticky, and full-bodied	Protein-rich flavor and mixed-grain tradition	Bean-flour noodles and pressed noodles	
Buckwheat flour	Buckwheat	Smooth to slightly coarse, with a mild bitter aroma	Rich in dietary fiber and associated with whole-grain diets	Buckwheat noodles and buckwheat preparations	
Mixed flour	Wheat, bean, oat, and/or other flours	Combined chewy, fragrant, and coarse-grain texture	More varied composition and flavor	grain and Mixed-grain noodles and three-flour preparations	

Note: Food labels and descriptions were standardized from the original manuscript. Images were resampled for legibility; original high-resolution image files should be supplied to the journal if available. Source: Authors' compilation.

Short-distance, walking-based mobility

Mobility was centered on the residential community. Common destinations included markets, pharmacies, nearby exercise areas, neighbors' homes, and community service points. Walking was the principal mode for short trips, supplemented by public transport when distance and physical condition allowed. This finding is consistent with ageing-in-place research showing that older adults depend strongly on the immediate neighborhood for services, familiarity, and social connection (Wiles et al., 2012).

Winter conditions intensified mobility constraints. Snow, ice, wind, uneven paving, steep ramps, and a lack of resting places could turn a short route into a substantial barrier. The practical service radius of a facility is therefore not a simple geometric distance. It depends on route continuity, crossing safety, entrance visibility, seasonal maintenance, and whether older adults can pause along the way. This pattern implies that location and the external-to-internal transition are part of interior design rather than separate planning issues.

Acquaintance-oriented and low-threshold social interaction

Many older adults in Datong have lived for long periods in work-unit compounds, industrial and mining communities, or established old-city neighborhoods. Their social networks are often based on repeated encounters with familiar people. Chatting at entrances, watching others play chess, walking together, shopping, square dancing, and participating in festivals are typically informal rather than appointment-based activities. The threshold for participation is low: a person can observe, greet others, or join briefly without committing to a formal program.

This pattern is important because social interaction is not produced simply by providing a large activity room. It depends on small spatial opportunities for pausing, watching, recognizing acquaintances, and entering or leaving an activity gradually. Corridors, windows, entrance halls, and spaces outside activity rooms may therefore be as socially important as designated recreation rooms. The built environment can support health partly by enabling outdoor exercise and social participation (Zheng et al.,

2022), but this mechanism depends on the everyday usability of such transitional spaces.

Continued family and intergenerational roles

Retirement did not mean withdrawal from family responsibilities. Older adults often continued to shop, cook, perform housework, accompany grandchildren, and participate in family meals and festival gatherings. Their available time was therefore coordinated with the schedules of adult children and grandchildren. Family orientation also influenced attitudes toward elderly care: a center that appeared to replace the family could be resisted, whereas a center that supported the family's care capacity was more acceptable.

The implication is that community care spaces should accommodate visitors and intergenerational activity without losing the comfort of older users. Family dining, short visits, parent-child corners, festival activities, and shared craft or cooking sessions can make the facility an extension of the neighborhood support network. Such spaces also allow older adults to maintain valued roles as caregivers, knowledge holders, and cultural transmitters

rather than being positioned only as service recipients.

Local cultural identity and urban memory

Cultural identity was expressed through attachment to Datong's historical landscape, northern Shanxi courtyard imagery, local opera and festivals, noodle-making traditions, and memories associated with the city's industrial and mining development. These references were not interchangeable decorative motifs. For older adults, they were connected to life histories, work experiences, family memories, and the transformation of the city.

Place identity research indicates that familiar environments and symbolic continuity can support security and self-identity in later life (Rowles, 1983). In Datong, local materials, colors, photographs, stories, sounds, and activity content may therefore increase recognition and belonging when used with restraint and authenticity. Figure 1 illustrates the Yungang Grottoes, one of Datong's most recognizable cultural landmarks. Its value for design lies not in literal imitation, but in the careful translation of colors, textures, proportions, and memory into a contemporary and non-institutional environment.

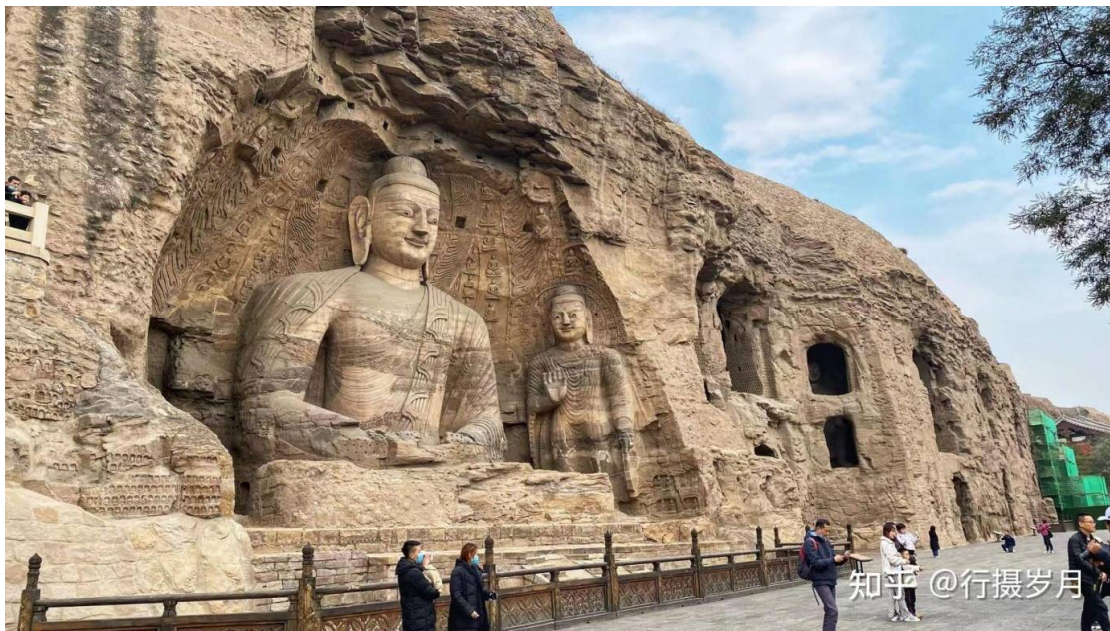


Figure 1. The Yungang Grottoes in Datong as a reference for local cultural memory. Source: Image retained from the original manuscript.

Integrated lifestyle-space evidence

Table 2 consolidates the results into an evidence matrix. It does not claim statistical prevalence. Instead, it shows how recurring qualitative patterns were identified and how

each pattern can be translated into a spatial requirement. The matrix also prevents design recommendations from being presented as isolated preferences: each strategy is linked to a behavior, a barrier, or a form of attachment observed in everyday life.

Table 2. Lifestyle-space evidence matrix for community-based elderly care design in Datong.

Lifestyle dimension	Recurring qualitative pattern	Evidence used in this study	Principal spatial implication
Daily rhythm	Regular morning, midday-rest, and afternoon-social activity; seasonal adjustment in winter	Observation, interview summaries, time-use documents	Time-sharing rooms, quiet rest zones, warm indoor winter activity space
Diet	Hot, soft, home-style foods; strong familiarity with noodles and mixed grains	Interview prompts, food descriptions, nutrition guidance	Age-friendly dining, healthy-meal choices, social dining and food-culture activities
Mobility	Short-distance walking; sensitivity to ice, wind, uneven surfaces, and long routes	Route observation, interview summaries, ageing-in-place literature	Nearby siting, continuous barrier-free route, vestibule, handrails, resting points
Social interaction	Frequent informal encounters within stable acquaintance networks	Behavioral observation and interview summaries	Entrance living room, corridor nodes, window seats, gradual participation spaces
Family roles	Continued shopping, childcare, cooking, visits, and festival gatherings	Interview summaries and field observations	Family lounge, intergenerational activity, shared dining, flexible visiting space
Cultural identity	Attachment to Yungang, old-city imagery, local opera, foodways, and industrial memory	Interview summaries and documentary analysis	Local color/material palette, memory wall, oral history and cultural programming
Health and technology	Demand for near-home health support alongside uneven digital literacy	Interview prompts and relevant literature	Integrated health/rehabilitation zones and dual-track digital-human services

Note: The matrix synthesizes qualitative patterns and does not report population prevalence. Source: Authors' analysis.

DISCUSSION: HOW LIFESTYLE SHAPES ELDERLY CARE SPACE

The findings suggest that lifestyle influences community-based elderly care space through six mechanisms: temporal demand, environmental accessibility, social affordance, family-system openness, cultural familiarity, and service-interface fit. These mechanisms connect the qualitative results to previous research and clarify why standardized room lists are insufficient.

Temporal demand and flexible functional organization

Regular daily rhythms create time-dependent demand. A consultation area may be busy in the morning, a dining area at noon, a rest area after lunch, and a social activity area in the afternoon. If each function is assigned to a permanently separate room, limited floor area may remain underused for much of the day. A time-sharing approach allows one room to support health education, calligraphy, meals, chess, opera, and community meetings at different times. This interpretation extends research on facility-use frequency by emphasizing that use is not only a question of whether a room exists, but also whether its arrangement

matches daily schedules and can be transformed efficiently (Wen et al., 2024).

Flexible space should not mean constant disorder. Older adults benefit from environmental legibility, so transformations should use predictable furniture modules, clearly marked storage, stable circulation paths, and consistent visual anchors. The design challenge is to combine adaptability with recognizability. In person-environment terms, flexibility is beneficial only when it reduces rather than increases the cognitive and physical demands placed on users (Lawton and Nahemow, 1973).

Accessibility, route continuity, and willingness to enter

Walking-based mobility makes accessibility a chain rather than a single barrier-free feature. The chain begins at the residence, continues through community paths and crossings, passes through the entrance and lobby, and extends to the destination room, toilet, and resting point. A failure at any link can reduce use. Research in Beijing and Shanghai has similarly shown that neighborhood built environments and the spatial distribution of facilities influence older adults' health opportunities and service

equity (Huang et al., 2022; Li et al., 2022).

For Datong, seasonal conditions add a regional layer to this mechanism. Wind-protected entrances, vestibules, snow- and water-resistant flooring, visible handrails, places to remove heavy outerwear, and short internal routes are not secondary details. They determine whether a person who has reached the building can enter safely and comfortably. The center should therefore be understood as a warm, legible continuation of the community route.

Social affordance and the transformation of circulation space

Acquaintance-based interaction depends on opportunities for spontaneous contact. Barker's (1968) behavior-setting perspective helps explain why a conventional corridor designed only for movement may suppress interaction, while a widened node with daylight, a bench, and a view can support greeting, observation, and conversation. The crucial concept is social affordance: spatial features make low-pressure interaction possible without forcing participation.

This finding complements research identifying cultural, health, rehabilitation, and daily-life services as key components of community-based care (Xiang et al., 2019). Services become socially meaningful when their spaces support gradual engagement. An older person may first sit near an activity, then watch acquaintances, and later join. Entrance living rooms, window seats, semi-open alcoves, and seating outside activity rooms can therefore increase participation more effectively than a single formal hall.

Family-system openness and intergenerational compatibility

The continued family roles of older adults challenge the idea of an elderly care center as an age-segregated institution. A family-support model should make it easy for adult children and grandchildren to visit, share meals, participate in festivals, or accompany an older relative to a consultation. At the same time, intergenerational use must not introduce excessive noise, speed, or visual complexity. Zoning and scheduling are therefore necessary so that family contact and quiet rest can coexist.

This mechanism is consistent with ageing-in-place scholarship, which emphasizes autonomy, caring relationships, and connection to home and community rather than simply remaining in a dwelling (Wiles et al., 2012). Community-based facilities can strengthen ageing in place when they supplement family capacity, preserve familiar roles, and provide a neutral location for support. They are less likely to be accepted when they communicate separation, dependency, or institutional control.

Diet, health support and the community living room

Dietary regularity gives meal spaces a central role in the daily operation of the facility. Previous research in China has found strong demand for canteen, health-care, rehabilitation, and daily-life assistance services (Xiang et al., 2019). In Datong, this functional demand is combined with a preference for hot, familiar, grain-based foods and sociable eating. Dining space should therefore be designed not as a narrow distribution point but as a community living room that supports nutrition, conversation, and observation.

Health support should be integrated without making the center feel clinical. Small areas for blood-pressure checks, health records, rehabilitation exercises, nursing consultation, and psychological support can increase the practical value of the center. Research on medical-care integration in small-city community facilities likewise indicates the importance of coordinating functional space for health and daily care (Su and Wang, 2022). The atmosphere should remain domestic and dignified through warm materials, acoustic control, daylight, and privacy where needed.

Cultural familiarity, place identity, and non-institutional atmosphere

Local culture influences acceptance through familiarity rather than spectacle. A standardized interior may satisfy technical requirements but still feel detached from users' lives. Place identity theory suggests that environments become meaningful through accumulated experience and memory (Rowles, 1983). For older adults, familiar colors, materials, photographs, stories, and activity content can help a new facility feel continuous with the city and the neighborhood.

The translation of Datong culture should avoid direct imitation of monuments or excessive themed decoration. More appropriate strategies include an ochre, sandstone, warm-gray, and timber palette; tactile materials associated with northern courtyards; old neighborhood photographs; oral-history displays; local opera sessions; festival craft; and food-related activities. Such elements can provide orientation and conversation topics while preserving a contemporary, calm, and respectful environment.

Digital-human service fit

Smart elderly care technologies can improve registration, activity booking, health monitoring, emergency response, and communication with family members. Yet digital competence varies greatly. A fully automated interface may exclude older users who have visual, cognitive, motor, literacy, or confidence-related difficulties. The appropriate mechanism is therefore dual-track access:

every digital service should have a clear human-assisted or low-tech alternative.

This conclusion aligns with broader evidence that the built environment in Asian long-term care settings influences autonomy, social interaction, and quality of life (Chaudhury and Xu, 2022). Technology should be treated as part of the environment and service process rather than as an independent equipment package. Screens, kiosks, queuing areas, staff desks, paper notices, seating, and wheelchair turning space must be designed as one coordinated interface.

INTERIOR DESIGN STRATEGIES FOR COMMUNITY-BASED ELDERLY CARE CENTERS

Based on the findings and discussion, seven interconnected strategies are proposed. They are intended as a localized framework for Datong rather than a fixed template. Their implementation should be adjusted to building size, service model, neighborhood type, and the functional abilities of users.

Flexible time-sharing layout

The spatial plan should be organized around daily rhythms. The entrance should support brief consultation, orientation, waiting, and informal conversation. A centrally located multi-functional room should be capable of changing between morning health education, midday dining overflow, afternoon chess or calligraphy, and festival activities. Movable tables, stackable or lightweight chairs with armrests, folding partitions, acoustic curtains, and accessible storage can increase reuse. However, circulation paths and major landmarks should remain stable so that changes do not undermine orientation.

Rooms should be scheduled according to expected peaks rather than assigned permanently to narrow functions. Quiet rest areas should be separated acoustically from active social rooms, especially around midday. In winter, a larger proportion of activity should be accommodated indoors, while in warmer seasons indoor and outdoor spaces should be linked through visible and accessible routes. A time-space operating schedule can help staff coordinate room conversion, cleaning, and equipment storage.

Continuous age-friendly safety and comfort

Age-friendly design should form a continuous system. External approach routes, thresholds, entrances, corridors, toilets, dining areas, and activity rooms should be reviewed as one sequence. Floors should be non-slip, low-glare, and visually distinct from walls without creating misleading patterns. Sudden level changes should be

eliminated; where ramps are necessary, they should have appropriate gradients, edge protection, handrails, and resting points. Main routes should be short, direct, and wide enough for wheelchairs and accompanying persons.

Lighting should combine even ambient illumination, task lighting, and low-level night guidance. Large-font, high-contrast signs should use both words and simple pictograms. Toilets should provide grab bars, emergency-call devices, space for assistance, and doors that can be opened from outside in an emergency. Furniture should have stable armrests, firm seats, rounded edges, and dimensions that facilitate standing. In Datong's winter conditions, vestibules, protected waiting zones, and places for coats and walking aids are particularly important.

Network of informal social spaces

A continuous social network should connect the entrance, lobby, corridor nodes, window areas, shared living room, dining area, activity rooms, and courtyard. These spaces should offer different levels of engagement: some seats should face each other for conversation, some should allow side-by-side observation, and some should provide partial privacy. Small groups of two to four seats are often more adaptable than long institutional rows.

Traffic space can become social space when it is widened selectively and equipped with daylight, views, handrails, and resting surfaces. Seating outside an activity room allows a hesitant user to observe before joining. A visible chess table near a circulation node may attract spontaneous participation. Acoustic separation remains necessary so that active social areas do not disturb rest, consultation, or rehabilitation. The objective is not to maximize noise or crowding, but to make everyday contact easy and voluntary.

Meal-assistance space as nutritional and social support

The dining area should integrate food preparation or delivery, collection, seating, take-away service, cleaning, and waste movement without crossing flows. Older users should be able to see the ordering and collection process clearly and avoid long standing queues. Two-person and four-person tables, as well as a limited number of shared tables, can accommodate people living alone, couples, and neighbor groups. Tables should allow wheelchair approach and chairs should include armrests.

Menus should include hot, soft, and regionally familiar options while meeting nutrition and chronic-disease management needs. A healthy-meal service can offer lower-salt, lower-sugar, and texture-modified choices without visibly stigmatizing users. Sound-absorbing ceilings or wall materials, warm but sufficient lighting, and non-institutional table settings can improve comfort. The

dining room may also host food education, noodle-making demonstrations, festival meals, and intergenerational cooking activities during off-peak periods.

Integrated rehabilitation and health-promotion areas

A basic health-support zone can include blood-pressure measurement, simple health assessment, rehabilitation guidance, and access to health records. A small rehabilitation area may provide gait training, stretching, balance exercises, and low-intensity equipment. Consultation rooms should protect privacy but remain easy to locate. Emergency access and staff observation should be considered without creating a surveillance-heavy atmosphere.

The visual language should avoid excessive medicalization. Domestic-scale furniture, warm materials, natural light, plants, and clear but discreet equipment storage can reduce anxiety. Health spaces should also support prevention and self-management through lectures, peer groups, and individual guidance. Where the center collaborates with a nearby community health station, routes and information exchange should be coordinated so that older adults do not repeat complex procedures.

Contemporary translation of Datong culture

Regional identity should be expressed through a coherent environmental narrative rather than isolated symbols. Colors may draw from Datong's sandstone, ancient walls, timber, and warm northern light. Materials can include wood veneer, textured plaster, brick-like surfaces, woven fabrics, and tactile details, provided that they remain safe and easy to maintain. Display areas can present old photographs, maps, neighborhood stories, work-unit memories, and resident-contributed objects.

Cultural identity should also be activated through programs. Local opera, calligraphy, festival handicrafts, oral-history recording, and food culture can turn display space into participatory space. Residents should be invited to contribute stories and materials so that cultural representation is not imposed solely by designers. The result should feel recognizable and dignified rather than nostalgic, theatrical, or commercially themed.

Intergenerational and family-support spaces

Family visitation and intergenerational use should be visible in the plan. A small family lounge, flexible dining corner, parent-child reading area, or shared craft table can support visits without occupying clinical or administrative rooms. These spaces should be near active zones but separated from quiet rest areas. Storage for children's

materials should be enclosed so that the environment remains orderly when not in use.

Programs can include festival meals, storytelling, homework companionship, traditional craft, and digital assistance provided by younger volunteers. Such activities allow older adults to contribute knowledge and care, maintaining reciprocal roles. The center should therefore communicate that it supports families and neighborhoods rather than replacing them.

Dual-track smart and human service interfaces

Digital systems may include check-in, service booking, health-data review, emergency contact, and video communication. Interfaces should use large text, strong contrast, simple steps, audible feedback where appropriate, and sufficient time for each action. Equipment should be positioned at accessible heights with space for wheelchairs and companions. Glare and privacy should be controlled.

Every digital process should have a staffed or paper-based alternative. A visible service desk, volunteer assistance point, printed schedule, and telephone booking option can prevent exclusion. Staff should be able to intervene without taking control away from users. Smart technology is successful when it reduces waiting and improves coordination while preserving human contact, choice, and dignity.

Integrated implementation

The seven strategies should be implemented as a coordinated system. A flexible room is ineffective if users cannot reach it safely; a cultural display is ineffective if the environment is noisy and uncomfortable; a smart terminal is ineffective if no assistance is available; and a dining room is ineffective if it does not match local meal rhythms. The design process should therefore begin with mapping daily routines and routes, then translate them into adjacency, time-use, furniture, lighting, material, service, and management decisions.

Post-occupancy evaluation should be incorporated after opening. Staff and older users can record which rooms are frequently used, where congestion occurs, which signs are confusing, and whether seasonal changes alter activity patterns. Such feedback supports small, continuous adjustments and prevents the localized framework from becoming another rigid template.

LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. First, it is an exploratory qualitative case study and does not provide statistically representative estimates for all older adults in Datong. The

available field materials did not include a complete participant-level numerical dataset, so no descriptive statistics, significance tests, or subgroup comparisons are reported. Second, exact differences among districts, housing types, ages, health conditions, living arrangements, and income groups require a larger and transparently documented sample. Third, the image materials in Table 1 were retained from the original manuscript and were resampled for legibility; original high-resolution source files should be supplied during production if available.

Future research should use a pre-registered or clearly documented mixed-method design. A standardized questionnaire could report participant characteristics, frequency distributions, means, and cross-group comparisons, while systematic behavior mapping could quantify duration, occupancy, and movement at different times and seasons. Multiple facilities should be compared before and after design intervention, and post-occupancy evaluation should examine whether the proposed strategies improve visit frequency, length of stay, social participation, perceived safety, and satisfaction. Research ethics approval or exemption, informed-consent procedures, fieldwork dates, site descriptions, and coding procedures should also be reported in full.

The framework should also be tested in other medium-sized northern Chinese cities. Comparative research could distinguish which needs are common to ageing in place and which are specifically associated with Datong's climate, food culture, industrial history, and heritage identity. Such comparison would strengthen the transferability of lifestyle-oriented design without erasing local difference.

CONCLUSION

Community-based elderly care centers can support ageing in place only when they fit the ordinary lives of older residents. The Datong case shows that lifestyle is expressed through regular and seasonally adjusted time use, familiar food practices, short-distance mobility, acquaintance-based social interaction, continuing family roles, and attachment to local cultural memory. These characteristics influence when spaces are needed, how they should be reached, which forms of interaction feel natural, how services should be delivered, and whether the environment is experienced as familiar or institutional.

The study proposes a shift from facility-oriented provision to lifestyle-oriented support. Spatially, this requires flexible time-sharing rooms, continuous age-friendly routes, informal social nodes, sociable and health-conscious dining, integrated rehabilitation and health promotion, intergenerational compatibility, culturally grounded atmosphere, and dual-track digital and human services. The strategies are mutually dependent and should be adjusted through post-occupancy feedback

rather than copied as a fixed template.

For Datong and comparable northern cities, the central design task is not to reproduce a generic image of "elderly space." It is to convert the repeated practices, relationships, and memories of older adults into spatial organization and service environments that are easy to reach, safe to use, meaningful to recognize, and dignified to inhabit.

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