Conceptual Residential Design Framework to enhance Well-being of Elderly in Thailand

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Abstract. A conceptual residential design framework was modelled using healing environmental and universal design concepts to enhance the well-being of the elderly in Thailand. Research methods involved informal interviews and observations for three Thai case studies. Interview results were summarized with related theories and literature. All factors were collated and listed. Seven experts in related fields were employed to confirm the factors and framework following the Delphi technique. Results showed that elderly characteristics had a positive direct effect on requirements of the elderly in a residential community which comprised two sub-factors including (1) healing environment, and (2) universal design. Each factor affected the willingness of the elderly to join communal events of the residential community. This framework will be used for quantitative analysis to determine future policy for environmental design and management of residential communities to enhance the well-being of the elderly in Thailand.

1. Introduction
An annual report of the Thai elderly [1], defined as those who are 60 years of age and above, concluded that they will account for 19.1%, 26.6%, and 32.1% of the Thai population in the years 2020, 2030, and 2040 respectively. This prediction has begged the question how the Thai government will cope when these situations arise. In response, a resolution has been proposed to enhance the well-being of the elderly residential community through healing and universal design concepts, but what should the environment look like? The objective of this research is to study and formulate a conceptual research framework of characteristics of the Thai elderly and their requirements for healing, and the universal design of the residential community. In order to achieve this objective, this research has: Identified components of the requirements of the Thai elderly, and their measurements. Developed a conceptual framework that demonstrates the relationships between the characteristics of the elderly, their requirements, and their willingness to join the residential community. The framework of characteristics will be proved by collecting empirical data used for quantitative analysis. The outcome will be a policy for the design and management of the residential community for enhancing the well-being of the elderly in Thailand.

2. Literature review
The National Committee for the Elderly, under Thailand’s Ministry of Social Development and Human Security [2], has defined the elderly as able to utilize social development resources, entitling them to recognition and support of their family, community, and state to lead a valuable life with dignity, and sustain their health and living standards as long as possible.
WHO (World Health Organization) [3] has stated on their website that most developed countries in the world have accepted the chronological age of 65 years as a definition of elderly or older people, but like many westernized concepts, this does not adapt well to the situation in Africa. While this definition is somewhat arbitrary, it is usually associated with the age at which one can begin to receive pension benefits. At the moment, there is no UN (United Nations) standard numerical criterion, but the UN-agreed cut-off age is 60+ to refer to the older population. In this research, the Thai elderly is also defined by the age of 60+, together with their health condition, classified in 5 levels, as follows: (1) Strong: can help themselves with everything, (2) Sometimes need some assistance, (3) Usually need assistance, (4) Need constant assistance, and (5) Unable to move; need constant assistance.

Plunz [4] stated that environmental design is the process of addressing surrounding environmental parameters when devising plans, programs, policies, buildings, or products. Environmental design can also refer to the applied arts and sciences - dealing with creating a human-designed environment. These fields include architecture, geography, urban planning, landscape architecture, and interior design. Environmental design studies the physical surroundings that provide the setting for human activity, ranging in scale from buildings and parks, green spaces for neighborhoods, and the local community. Environmental design is defined as the physical and constructed environment in which people live, work, and enjoy recreation on a day-to-day basis. In addition, environmental design is concerned with the way these places are experienced and used, as well as other aesthetic elements that contribute to the quality of community environments. Environmental design would be considered in this research in terms of requirements for the Thai elderly.

WHO [5] has given an initial definition of “health” in a common description. In 1998, the definition was improved to mean a dynamic state of four-dimensions, including physical, mental, social, and spiritual well-being. Jonas and Chez [6] believed an emphasis on healing is key to the future medical management of chronic illness and the establishment of sustainable approaches to health care. Defined as the process of recovery, repair, and return to wholeness, healing is the foundation for a vision of medicine that integrates diverse approaches from around the world for the alleviation of suffering, the enhancement of well-being, and the treatment of chronic illness.

Healing is facilitated through the development of proper attitudes and intentions in both the provider and the recipient, use of personal self-care practices, creating healing relationships, applying the knowledge of health promotion and maintenance, and the appropriate integration of complementary and conventional medicine practices. Nelson et al. [7] described “healing environment” as synonymous with the therapeutic environment. The therapeutic environment is one that is designed to not only support and facilitate state-of-the-art medicine and technology, patient safety, and quality patient care, but also to embrace the patient, family and care providers in a psycho-socially therapeutic environment. From the above, it could be concluded that the therapeutic or healing environment is a part of the spiritual environment of the Thai elderly. The concept of spiritual well-being and healing environment would be checked and compared between the mentioned literature and existing cases in Thailand. The conclusion would then be used in the questionnaire design.

Burgstahler [8] has defined universal design as designing any product or environment that involves the consideration of many factors, including aesthetics, engineering options, environmental issues, safety concerns, industry standards, and cost. Designers often focus on the average user [8]. The National Disability Authority [9] has defined universal design as the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age, size, ability or disability. The Center for Universal Design [10], established seven principles of universal design to provide guidance in the design of products and environments. The principles include:

- Equitable use - the design is useful and marketable to those with diverse abilities.
- Flexibility in use - the design accommodates a wide range of individual preferences and abilities.
- Simplicity and intuition - use of the design is easy to understand, regardless of the user’s experience, knowledge, language skills, or current concentration level.
Perceptible information - the design communicates necessary information effectively to the user, regardless of ambient conditions or the user’s sensory abilities.

Tolerance for error - the design minimizes hazards and the adverse consequences of accidental or unintended actions.

Low physical effort - the design can be used efficiently, comfortably, and with a minimum of fatigue.

Size and space for approach and use - appropriate size and space is provided for approach, reach, manipulation, and use, regardless of body size, posture, or mobility.

Paul et al. [11] stated that a community is a social unit of any size that shares common values, or is situated in a given geographical area (e.g. a village or town). It is a group of people who are connected by durable relations that extend beyond immediate genealogical ties, and who mutually define that relationship as important to their social identity and practice. The WHO Regional Office for Europe [12] defined “a community residential health facility as a non-hospital, community-based mental health facility that provides overnight residence for people with mental disorders”. The facilities include: supervised housing unstaffed group homes, group homes with some residential or visiting staff, hotels with day and night staff, hostels and homes with 24-hour nursing care staff, halfway houses, and therapeutic communities. Both public and private not-for-profit and for-profit facilities are included.

Perkins et al. [13] stated in a textbook of “building type basics for senior living” that common facilities within a skilled-nursing facility serving all of the nursing units may include: multipurpose room, coffee shop/snack bar, gift shop, library, outdoor terraces, recreation areas, art/activity, clinic, rehabilitation. The textbook also stated that, in adult communities, landscaped and natural areas should be developed for walking, contemplation, golf, lawn, sports, shuffleboard, gardening, fishing, and other recreational activities.

Jabareen [14] defined a conceptual framework as a network or plane of interlinked concepts that, together, provide a comprehensive understanding of a phenomenon or phenomena. Each concept of a conceptual framework plays an ontological or epistemological role in the framework. Jabareen [14] also suggested 8 phases in the procedure of conceptual framework analysis including: (1) mapping the selected data sources, (2) extensive reading and categorizing of the selected data, (3) identifying and naming concepts, (4) deconstructing and categorizing the concepts, (5) integrating concepts, (6) synthesis, re-synthesis, and making it all make sense, (7) validating the conceptual framework, and (8) rethinking the conceptual framework.

3. Research methods

The Delphi technique was developed by Olaf Helmer and Norman Dalkey in the 1950s and is still a widely used and accepted method for achieving convergence of opinion concerning real-world knowledge solicited from experts within certain topic areas [15]. The technique is designed as an expert group communication process and aims to conduct detailed examinations and discussions of a specific issue. The process is continuously iterated until a consensus is determined to have been achieved. This research used the Delphi technique to confirm the factors and framework of environmental residential communities to enhance the well-being of the elderly in Thailand. Steps of the Delphi technique were as follows:

Step 1. Identify the factors: Informal interviews and observations were conducted for three case studies in Thailand in terms of management processes and environmental designs. Interview results were summarized along with related theories and literature such as textbooks research articles (ISI, SCOPUS and ScienceDirect databases) and related annual reports in Thailand. All factors were collated and listed before proceeding to the next step.

Step 2. Confirm the factors: The listed factors were confirmed by seven experts in related fields using the Delphi technique. The experts were selected based on their professional experience as follows:

- Three experts involved in the management of residential communities for the elderly, working in both government and private sectors.
- Two experts in elderly studies from academic institutions.
- Two experts in design aspects of residential communities employed by private companies.

The listed factors were confirmed by a consensus of the seven experts’ opinions directly and individually starting from expert 1, 2, 3,..., 7 and returning to expert 1 circularly. All experts carefully and individually considered the listed factors. Anonymous responses were aggregated and shared with the group after each round until a consensus was saturated. Once the listed factors were confirmed and categorized by the seven experts, they were constructed as the conceptual framework in the next section.

Step 3. Draft the conceptual framework: According to the expert opinions, confirmed factors were categorized and arrows were drawn between the factors as a draft conceptual framework. This was then reconfirmed by the seven experts by repeating Step 2. The final framework was considered as the conceptual research framework.

4. Results
Opinions of the seven experts as confirmed factors, items as indicators of the Thai elderly’s requirements in healing environment and universal design of residential communities are listed in Table 1.

| Factor                      | Item                                                                 |
|-----------------------------|----------------------------------------------------------------------|
| Elderly's Characteristics   | CH1: Age                                                             |
|                             | CH2: Health                                                          |
| Healing Environment         | Q1: Liking natural light during the daytime                          |
|                             | Q2: Liking the sounds of nature such as birds singing, water flow    |
|                             | Q3: Liking listening to music during the day                         |
|                             | Q4: Liking the smell of flowers in the residential area              |
|                             | Q5: Focusing on "colors“ (light-dark colors, bright-pensive colors) in the residence |
|                             | Q6: Giving importance to "shapes“ (geometry, natural and independent shapes) in the residence |
|                             | Q7: Liking the paintings on the walls                                |
|                             | Q8: Liking the sculptures displayed on tables or floors              |
|                             | Q9: Liking flowers in vases for decoration of the residence          |
|                             | Q10: Attention to the texture (soft, hard, rough, smooth) of the floor, wall, furniture in the residence |
| Universal Design            | Q11: Need for a buoyancy aid (handrails) for walking                 |
|                             | Q12: Need for a buoyancy aid (handrails) for sitting-up              |
|                             | Q13: Need for a flat surface floor of the residence (no stairs)      |
|                             | Q14: Need for ramps instead of stairs                                |
|                             | Q15: Liking a bright environment                                     |
|                             | Q16: Liking an orderly environment                                   |
|                             | Q17: Need for road crossing signals in the residential community    |
|                             | Q18: Need for sound signals when there is an emergency in the residential community |
|                             | Q19: Need for a transmitter to receive a signal in the residence when there is an emergency |
| Willingness                 | W1: Interested in the residential community                          |
|                             | W2: Willingness to live in the residential community                |
Table 1. Factors for Thai elderly’s requirements and their measurement items.

| Factor                        | Item                                                                 |
|-------------------------------|----------------------------------------------------------------------|
|                               | W3: Willingness to recommend the residential community to others     |

In Table 1, factors of the elderly’s characteristics comprised age and health as CH1 and CH2. The elderly’s requirements comprised two sub-factors as (1) healing environment; 10 items (Q1 to Q10), and (2) universal design; 9 items (Q11 to Q19), while willingness comprised 3 items (W1 to W3).

All factors for Thai elderly’s requirements and their measurement items were used to construct the conceptual framework shown as figure 1. This framework was extended to include more detail of the items, variables and their indicators as shown in figure 2.

![Figure 1. Conceptual framework of residential design to enhance the well-being of the elderly in Thailand.](image-url)
Figure 2. Detailed conceptual framework.

5. Conclusions
This research studied factors related to the Thai elderly’s requirements to enhance their well-being in a residential community by modeling a conceptual framework. Three case studies in Thailand were observed and interviews were conducted in terms of environmental design and management. Factors were identified from the three case studies and confirmed by seven experts using the Delphi technique. Results indicated that requirements of the elderly in a residential community included age and health as CH1 and CH2, healing environment (Q1-Q10), universal design (Q11-Q19), and three factors of willingness (W1-W3) as shown in table 1. The conceptual framework, as the outcome from the Delphi technique (figure 2), showed that factors of the elderly’s characteristics had a positive direct effect on their requirements in a residential community. These requirements comprised two sub-factors including (1) healing environment, and (2) universal design. All factors impacted on the willingness of the elderly to join communal events of the residential community. The framework in figure 1 was extended to include more details of the items, variables and indicators as shown in figure 2. This framework will be used for quantitative analysis to determine future policy for environmental design and management of residential communities to enhance the well-being of the elderly in Thailand.

6. References
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