

Integrated Pathways to Healthy Ageing (PHA): A Conceptual Ecosystem

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Abstract

Background Ageing is commonly accompanied by an associated increase in the prevalence of chronic musculoskeletal, metabolic and mental health conditions that affects physical capacity and overall decline in quality of life. To date, most health interventions have been monodisciplinary and monomodal, with a relatively narrow focus and loci of impact. What is now being advocated is more interdisciplinary health promotion measures for the attainment of healthy ageing. This paper reports on an empirical intervention designed to integrate chiropractic and osteopathic services with medical and physiotherapy services in an Australian Residential Aged Care facility. It replaces the traditional cause-effect linear focus with a conceptual ecosystem and identifies an action framework to underpin the design of effective actions to facilitate Integrated Pathways to Healthy Ageing.

Methods A qualitative multi-method research approach was chosen that included a case study of a real-time intervention, utilising a modified action research methodology combined with interpretive data analysis. This enabled the experience of change to be planned and actioned while, at the same time, being observed and reflected by a project team established for this purpose. The interpretive analysis by the project team members was based on a conceptual ecosystem based on six tenets of a distributed leadership, collaborative and participative, leadership approach.

Results The findings confirmed the applicability of the six tenets of the conceptual ecosystem for an integrated approach to aged health care. This led to the formulation of a holistic approach termed a Conceptual Ecosystem of Integrated Pathways to Healthy Ageing together with a conceptual Ecosystem Action Framework.

Conclusions The paper concludes that the conceptual Ecosystem can be used to effectively integrate chiropractic and osteopathic services with medical and physiotherapy services to action more holistic, synergistic Integrated Pathways to Healthy Ageing. While further research is required, the authors propose that the conceptual ecosystem and associated action framework can form the basis of actions needed to develop more collaborative approaches to integrate a greater range of health services into multi-disciplinary, multi modal pathways to healthy ageing.

Background

Worldwide the population is ageing, with this longevity bringing a range of issues to the individuals, their families and the community. Normal ageing involves physical, cognitive and social changes, “some of which can be anticipated and managed, some requiring support and others involving care, especially when capacity declines or when one or more chronic diseases add to the complexity of a person’s needs”[1]. The World Health Organisation (WHO) has identified a range of musculoskeletal condition risk factors (including inadequate physical activity, obesity, smoking and poor nutrition) as prevalent across the lifespan from adolescence through to older age, although the prevalence increases with age [2]. A recent Interim Report of the Royal Commission into Aged Care Quality and Safety in Australia itemised a

broad range and prevalence of adverse health conditions associated with ageing, including “dementia, mental illnesses such as anxiety and depression, as well as physical diseases like diabetes and arthritis leading to increased frailty: bones become brittle, balance becomes less certain, posture more adversely affected” [1] For older people disconnection from their homes and supportive community networks, can further exacerbated these characteristics [3]. These combined factors lead to huge financial costs associated with managing these ailments, adding a further burden to older adults, their families and the healthcare system [4]. In Australia, the burden of age-related disability and illness is expected to keep increasing as the current population ages, with the escalating economic costs of managing chronic conditions having exceeded the 2018 estimate of \$320 billion [5]. In summary, the health and economic effects of ageing are broad ranging with adverse impacts at an individual, societal, national, and international level.

To address these challenges, measures to prevent adverse health impacts and promote positive health outcomes are advocated [6, 7]. Research into the clinical consequences of ageing has occurred [7] with the WHO highlighting a range of prevention and management strategies that include non-pharmacological interventions such as exercise, weight management, psychological therapies, pharmacological therapies as well as specialist and/or surgical care [2, 8]. Related research into how to manage the complex health issues associated with ageing has advocated a multidisciplinary approach to the needs of older people that are often complicated by multiple chronic comorbidities, polypharmacy and long-standing opioid and/or sedative use [9, 10]. Despite this research, focus has remained on mono-disciplinary and mono-modal approaches that typically concentrate on one discipline or approach and one loci of impact that singles a body part. This has led to research that is advocating a move from a silo to a synergy approach [11]. A synergy approach requires a more holistic combination of personal, physical, mental health, dietary and lifestyle patterns as well as psychological, social and medical responses and support for healthy ageing of older people [12, 13]. This might include a combination of manual therapy and exercise plus improved dietary patterns to actively engage the older person in self-care to improve their mobility, reduce frailty and promote quality of life [12]. It may also include support for self-help and group exercise regimes that can assist in promoting movement, strength, flexibility and social engagement to empower older people to develop their health and wellness. It may include a combination of Eastern and Western approaches to support their wellbeing. Chinese Medicine, for example, highlights the importance of physical activities, such as Yoga and Tai Chi, to promote cardiovascular fitness and muscle strength, improve balance and prevent falls. A study [14] reported both Tai Chi and Yoga promotes physical exercise and opportunities for older persons as a means to enhance their quality of life through interaction between an ageing persons’ physical, emotional and intellectual wellness.

Formal aged care supports differ between countries. In Australia, services are provided to those who can no longer live independently and care for themselves. These services vary from support provided in the older person’s own home, or through the community, or in group homes, or in purpose-built residential facilities [1]. In-home assistance may include clinical care as well as personal care and help with everyday living activities. In residential settings, intensive care is provided to people with greater physical

or cognitive problems or general frailty. A recent Royal Commission into Aged Care Quality and Safety in Australia highlighted the need for Residential Aged Care Facilities to adopt more interdisciplinary, consumer-driven approaches engaging residents in “meaningful sociocultural activities that promote wellbeing and quality of life rather than simply relying on more traditional top-down prescriptive/pharmacological approaches” [1]. Such a holistic approach has implications for how to achieve integration between these services. The next section provides an example of how chiropractic and osteopathic services can be integrated with medical and traditionally available clinical services as a contribution to more integrated pathways to healthy ageing.

Implications for chiropractors and osteopaths

As primary health care practitioners, chiropractors and osteopaths play an important role in health promotion and injury prevention. Chiropractic and osteopathic procedures have been described as safe and effective in managing the burden of musculoskeletal conditions, in reducing pain and in improving mobility of ageing persons [15, 16]. Chiropractors centre their practice on the diagnosis, management and prevention of mechanical disorders of the musculoskeletal system, and their effects on general health. Osteopaths are also trained in manual therapies, exercise prescription and other evidence-based techniques to help patients manage their musculoskeletal condition(s). The Code of Conduct for chiropractors and osteopaths emphasises the importance of person-centred, evidence-based, multidisciplinary approaches [17]. Chiropractors and osteopaths each provide management strategies, including the care of acute injuries (sprains or strains) together with the provision of exercise therapy, rehabilitation, and chronic pain management. Chiropractors, for example, can provide low-force manipulation, soft tissue (massage) therapy to alleviate pain through a non-pharmacological approach as well as being trained to communicate and collaborate with other health care professions to co-manage the patient with other modalities or appropriate referral as needed [18]. Thus, these services are potentially valuable additions in addressing musculoskeletal issues facing older people. The Australian Professional Association for osteopathy states that “the aged care industry needs osteopaths and other allied health professionals to continue to work with other primary care professionals to help manage the projected increase in demand” [19]. The focus is on integrating dietary, lifestyle and rehabilitation approaches to patient care to complement existing services provided by geriatric care teams [19].

In Australia, research has identified that seventy-four percent of chiropractors regularly see older people in private practice, while 12% of chiropractic patients have been identified as older people [20]. Given the ability of chiropractors and osteopaths to care for older people, and evidence that older people attend chiropractors in private practice, it is interesting that chiropractic and osteopathic services are under-represented in Residential Aged Care. This is particularly the case in comparison to medical and mainstream clinical services provided by medical doctors and nurses [15, 20], as well as allied health care such as physiotherapy, podiatry and occupational therapy. Among explanations for this is recognition of the complexity involved in adopting different ways of working required for a more integrated approach. What is recommended is a more holistic environment in which a supportive context, culture, and new

mental paradigm exists in which separate disciplines recognise and respect the expertise and value of the contribution of each discipline [21].

This paper presents the findings of an empirical case study of an intervention in a Residential Aged Care facility in Australia in which chiropractic and osteopathic services were added to the existing medical, nursing and physiotherapy services. The intervention was guided by an ecosystem based in six tenets of a distributed leadership approach that supports collaboration for change. It was hoped that this would provide lessons learnt upon which actions could be used to guide more integrated pathways to healthy ageing.

Methods

Given the degree of change identified as necessary to address the complexities described above and the emerging nature of the question, a qualitative approach utilising multi-methods was chosen to provide an in-depth view of challenges. This consisted of three elements. First, a case study methodology enabled investigation within a real-life context [22]. Second, a modified four stage Action Research approach enable real time observation and reflection on issues as they emerged [23, 24]. Third, given the complexity of the context [25], an interpretivist approach was adopted to enable third-party analysis of the 'views or perspectives of these experiences' [26].

The case study chosen was a Residential Aged Care facility that caters predominantly for Italian residents. The intervention was planned to build on an established partnership between chiropractic educators and students from the Allied Health group of a large metropolitan Australian university and the Residential Aged Care facility. An on-site chiropractic clinic had been established in 2014 within the Residential Aged Care facility through which chiropractic students from the university provided tailored, clinically supervised, services to residents, that were integrated with existing medical, nursing and physiotherapy care provided to the residents. The student chiropractic clinics had been operating for five-years with positive feedback from residents and families, care staff and students as to reported reduction in levels of pain, improved mobility and an effective integration of chiropractic care with medical, nursing and physiotherapy care residents. This had included feedback from residents of how the treatment had not only made them feel better, but also how it had improved their mobility. It has included students feedback as to the positive opportunity that participation in such an enriched learning experience had helped them refine their sense of touch and sensitivity as well as to become more personally and professionally aware of the care needs of older people. It had included feedback from aged care workers that the clinical services helped to provide a range of assistance that complemented, and spread the load, of treatment provided by the physiotherapists. Based on this positive feedback, in 2019 the management of the Residential Aged Care facility approached the university to consider an extension of the student allied health clinics to include other services to assist in helping residents to better manage pain, enhance mobility, social engagement and improve their physical and mental health and wellbeing. Given that academics from a range of specialities within the university Allied Health cluster group (osteopathy, Chinese medicine and exercise sciences), together with academics from the Applied Health cluster

(psychology, nursing), and from Science (nutrition) had been considering a more holistic multi-disciplinary, multi-modal approach to healthy ageing, it provided an opportunity to explore this in practice.

The modified action research approach enabled the intervention to be planned and actioned, while simultaneously observed and reflect upon by the project team established for this purpose. Action research seeks to understand the world by trying to change it, collaboratively, and following reflection. It places emphasises on collective inquiry and experimentation grounded in experience and social history [24]. By having an established project team to plan the intervention and also facilitate the task of observation and reflection on activity, any ethical concerns related to participation by residents, students and staff were removed. Further, it enabled any adjustments to the service being provided to residents or to the training needs of the students providing the service to occur in a seamless and a timely fashion..

An interpretivist analysis was included to enable analysis of the project teams observations and reflections against the six tenets of the conceptual ecosystem developed by one of the project team members with expertise in a six tenets of distributed leadership approach. A conceptual ecosystem was considered as relevant for a holistic, multi-disciplinary and multi-modal aged heath provision given its emphasis on engaging many people in collaborative activities required to move beyond the traditional single cause-effect linear trajectory of a mono-discipline and mono-modal approach. Organisational ecosystems are emerging, borrowing from biological models, to be used metaphorically by organisations to “explain the emergence and evolution of organisations and human systems as organisational ecosystems” [27, 28]. Basing the conceptual ecosystem on the tenets of a distributed leadership approach [29, 30] was considered appropriate given that a distributed leadership approach has been used to explore new frameworks for leadership in health [31–36] and has also been used to underpin research into new forms of collaboration and participation in the provision of residential aged care. Indeed it has been described as having the potential to “enhance interprofessional teamwork, collaborative decision making, and ‘whole resident’ care” [37]. A distributed leadership approach encourages active participation by all relevant experts, an element seen as important in encouraging a move from a single to a multi-disciplinary, multi-modal approach.

Building on earlier Australian research into a distributed leadership approach in higher education [29, 30], a conceptual ecosystem consisting of six tenets was designed, with the aim of exploring its application in developing integrated pathways to healthy ageing :

1. *Engagement* of a broad range of experts in decision making;
2. *Enabling* collaboration and participation through the establishment of a context of trust and a culture of respect that supports change and nurtures relationships;
3. *Encouraging* action that raises awareness and provides scaffolding for knowledge development and to facilitates networks and collaboration;
4. *Enacting* (embedding) change through supportive processes and systems;
5. *Evaluating* against purpose and;
6. *Emergence* to sustain change.

¹ The detailed clinical and management experience is the subject of related research papers

Results

The Project Team established to both oversee the practice intervention and observe, reflect on and interpret the findings consisted of four academics with responsibility for Allied health research and the education of students. This included: the academic co-ordinator of the existing student chiropractic clinic at the Residential Aged Care facility (who was also the lead contact of this intervention); the Associate Dean of the Allied Health Cluster; the Head of the Preventative and Integrative Health Program; and an academic in clinical psychology with expertise in geriatric mental health. In addition, there was an academic from the Business College with expertise in a distributed leadership approach. Joining the academics were the CEO of the Residential Aged Care facility and the Vice President of the community organisation (University for the Third Age – U3A) which specialised in community ageing issues, particularly in collaborative approaches to assist ageing persons. The project team met on a weekly basis throughout the intervention to discuss observations and reflections of progress and at the conclusion of the intervention to interpret their formative observations and reflections against the conceptual ecosystem. A summary of the results of their analysis are set out below under each of the six tenets.

Tenet 1: Engage

Action to implement the intervention commenced with meetings of academics from the University Allied and Applied Health and Science disciplines, the CEO of the Residential Aged Care facility and representatives from two community organisations with expertise in community collaboration, U3A and Co. As. It. (a community based Italian assistance organisation) [38]. The aim of these meetings was to identify the degree of interest in the prospect of multi-disciplinary engagement in integrated pathways to healthy ageing. Following a SWOT activity designed to identify Strengths, Weaknesses, Opportunities and Threats to each discipline, it was agreed that the initial focus would be the addition of a student osteopathic clinic to the student chiropractic clinic to test the ecosystem approach, which could then be used as the basis for further disciplinary extension. Based on this decision, the Project Team discussed the importance of retaining the collaborative interest of academics from the health disciplines beyond chiropractic and osteopathy. It was agreed that academics would continue to meet as a Community of Interest (CoI) to undertake research from a disciplinary-specific perspective into links being made between their discipline and integrated pathways to healthy ageing. The outcome would be preparation of a series of papers for a Special Issue journal publication. The importance of this was evidenced at a final Forum that discussed the findings of the intervention. This was attended by most of the academic members of the CoI, with several presentations made on the initial findings from their disciplinary-based research.

The clinical intervention program began in June and continued to November 2019 with weekly, free to resident, clinics provided by six chiropractic and six osteopathy students, who self-nominated to participate in the clinics. On average, each student provided care to six residents during a four-hour shift. Residents and their family were consulted about whether they wished to attend the clinics. Several

residents who had been attending the chiropractic clinics agreed to both continue the existing services being offered and to attend the osteopathic clinics. Residents receiving treatment varied from those needing low-intensity care who lived relatively independently, to those needing higher intensity care, some with cognitive impairment and dementia. Informal concern raised by physiotherapists already providing a (funded) service at the Residential Aged Care facility as to the impact these clinics on the (limited) time they had to provide care, was allayed by the academic supervisors of the students assuming responsibility for organising the clinics such that they would be integrated into the existing provision of services rather than unduly drawing on the limited time available to the existing physiotherapists..

Tenet 2: Enable

Action to enable collaborative relations based in trust and respect was achieved through agreement at the first meeting (see above) on a purpose, output, and a collaborative platform. First, the purpose was stated as the identification of a holistic approach to integrated pathways to healthy ageing with possible interventions designed to improve health, cognition and mental wellbeing. It was further agreed that the holistic approach would be based on an ecosystem made up of the six tenets of a distributed leadership approach. Second, the collaborative platform and process to be established would take into account the views of all interested parties. It would be informed by the community inclusiveness model designed by the U3A and adopted by the Victorian government [39] and the Positive Ageing Strategy of the local council [40]. Third, that the output of the intervention would be a framework upon which further research funds could be attracted that would itself aim to underpin a government policy submission for integrated (allied health) pathways for aged care.

Tenet 3 Encourage

A range of activities were undertaken to encourage participation by all parties. The university provided financial support for academics to include time in their workload to participate in the intervention and explore new networking opportunities, and legal support for students to provide services in the clinics. Student alumni provided information to current students participating in the clinics as to the skills they would develop. Academic supervisors provided information to the residents and their families as to the value to their health of the services available in the clinics. Staff at the Residential Aged Care were recognised for the contribution they were making in supporting the initiative. Community partners were encouraged to develop joint submissions for expanded collaborative community research activities. Professional Associations were provided networking opportunities to explore the value of the integrated pathways approach to healthy ageing ongoing collaborations

Tenet 4 Enact (Embed)

To communicate knowledge and understanding about the experience of integrating chiropractic and osteopathic services as part of healthy ageing, a number of opportunities were developed. Face to face communication was undertaken on a regular basis by the leader of this intervention with representatives from local and State government agencies with a focus on aged care and Professional Associations. A final open Forum on the findings from the intervention provided the opportunity for communication

beyond those who had participated. Attendance at the final Forum included representatives from a Professional Associations (Australian Chiropractors Association and Osteopathy Australia) and relevant tiers of government (local Council, state and federal departments plus a private medical provider (Medicare Private auspicing the HealthStrong Allied Healthcare program). Virtual communication was undertaken with the contracting of a digital illustrator to film videos students, staff, residents and family at the Residential Aged Care Facility and to design a website to explain the final outcome. In addition, the university encouraged the submission of academic publications to ensure reach to the broader academic Allied Health community.

Tenet 5 Evaluate

The success of the intervention in terms of its achievement of an integrated approach to aged health care was informally evaluated by residents and their families, staff and students. Requests for ongoing continuation and extension of the clinics in the Residential Aged Care facility, was considered positive evaluation of the success. Recommendations to a 'sister' Residential Aged Care facility by the CEO and managers to explore a similar program by the university, was also considered a positive outcome. Student evaluation of the intervention was formally provided through the university-based Student Experience Questionnaire which recoded positive student feedback. Finally, positive support for ongoing and extended partnerships by the community groups involved was considered positive evaluation of the collaborative platform. The achievement of the identified purpose and outcome is also regarded as positive evaluation of the intervention.

Tenet 6 Emergence

Indications that the conceptual ecosystem has potential for ongoing emergence as a holistic approach to healthy ageing were identified as the intervention progressed. One example was the agreement to use the ecosystem to further extend the intervention to design and develop a community vegetable and herb garden at the Residential Aged Care facility in 2020. Initial plans included the ongoing partnership with an Italian welfare organisation (Co As It) to provide volunteer assistance in the establishment of the garden, together with academics and students from landscape architecture and students and a dietician from Science. Support from residents and their families was both formally and informally provided, particularly in the proposal to use the expertise of the residents and their families to advise on which vegetables and herbs to cultivate consistent with the cultural needs of the Italian residents. Second, was the request from the Residential Aged Care centre, together with a 'sister' centre, for academics from clinical psychology to design and deliver a dementia awareness training program for family members of residents and the staff, in collaboration with the existing U3A program. A third example was the request for an ongoing program of Tai Chi sessions. Finally, was the University Allied Health Cluster decision to map existing curriculum content in caring for older people as taught in its disciplines of chiropractic, osteopathy, Chinese medicine and exercise science against capabilities identified as required for inclusive policy and practice for health ageing [41, 42]. This to be used to design a Master level program for chiropractic and osteopathic students to develop additional skills required to work effectively in the aged care sector.

² Research underway

Managing pain to improve balance, prevent falls and promote quality of life in older people.

Systematic review of the effects of manual therapies on stability in people with musculoskeletal pain.

Establishing an objective tool for evaluating frailty in older populations; the influence of locally applied vibration on the risk of falls in older adults.

Implications of the role of the neck in cardiovascular regulation during orthostasis for the management of orthostatic hypotension in older people.

Defining the safe and effective biomechanical characteristics of the spinal manipulative thrust in older people

Discussion

Discussion on the findings led the Project Team to several conclusions related to each of the six tenets. That the engagement of each of the parties was critical to the success of the intervention. That in order to plan and develop a successful collaborative process there was need for agreement on the purpose, output, and a collaborative platform to underpin all actions. To ensure ongoing participation to facilitate the integrated approaches, there was need for support in the form of facilitation to mentor new networks, raise awareness and build new knowledge. That an integrated approach to communicating the experience through face to face and digital (virtual) opportunities was needed to embed the change for ongoing implementation. To ensure a focused and inclusive approach to evaluation there was need to use both quantitative and qualitative measures of outcome against purpose. It was agreed that further research, including the potential use of comparative benchmarking, is needed to identify more inclusive forms of evaluation. That given the emergence of new disciplines interested in future integration into a pathways approach to healthy ageing, the potential for sustainability was evidenced. In combination these points confirm the applicability of the six tenet conceptual ecosystem as useful in the design and implementation of interventions for integrated pathways to healthy ageing.

Further, that these findings establish the platform for an action framework upon which further research funds can be attracted. Table 1 identifies this Conceptual Ecosystem Action Framework for Integrated Pathways to Healthy Ageing. This Action Framework identifies, first, the need to focus action on a series of (phased) actions (that may occur simultaneously). This provides the scaffolding for the elements of the ecosystem, whilst also enabling flexibility to adapt actions to different environments. The vertical axis allows the various participating groups to be identified (in this case three groups are assumed). The horizontal axis identifies the other five tenets. The intersection of these two axes identifies the action needed to support the ecosystem for integrated pathways to healthy ageing.

Table 1
Conceptual Ecosystem Action Framework for Integrated Pathways to Healthy Ageing

ENGAGE	ENABLE	ENCOURAGE	EMBED	EVALUATE	EMERGENCE
Participant 1	Agree on purpose	Identify and source finance	Develop virtual communication	Identify informal assessment	Extend disciplinary engagement
Participant 2	Approve collaboration platform.	Devise collaborative opportunities	Design F2F communication	Develop formal assessment	Source new partnerships
Participant 3	Agree on outcomes	Plan professional development.	Arrange open public communication	Identify Benchmark opportunities	Design new skill developments
© Adapted from [29, 30]					

Conclusions

Whilst acknowledging the limitations of a single case study to produce generalisable findings, the conceptual ecosystem was found to be effective in integrating chiropractic and osteopathic services with medical and physiotherapy services to action more holistic, synergistic Integrated Pathways to Healthy Ageing. This conceptual ecosystem is offered as the basis for further research to test its more general application in designing and implementing actions to develop more collaborative approaches to integrate not only chiropractic and osteopathic services, but also an extended range of health services into multi-disciplinary, multi modal pathways to healthy ageing.

Declarations

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Contributions

DV and SJ both contributed to the study design, data collection, analysis, writing of the paper, and final editing. The author(s) read and approved the final manuscript

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study

Competing interests

The authors declare that they have no competing interests

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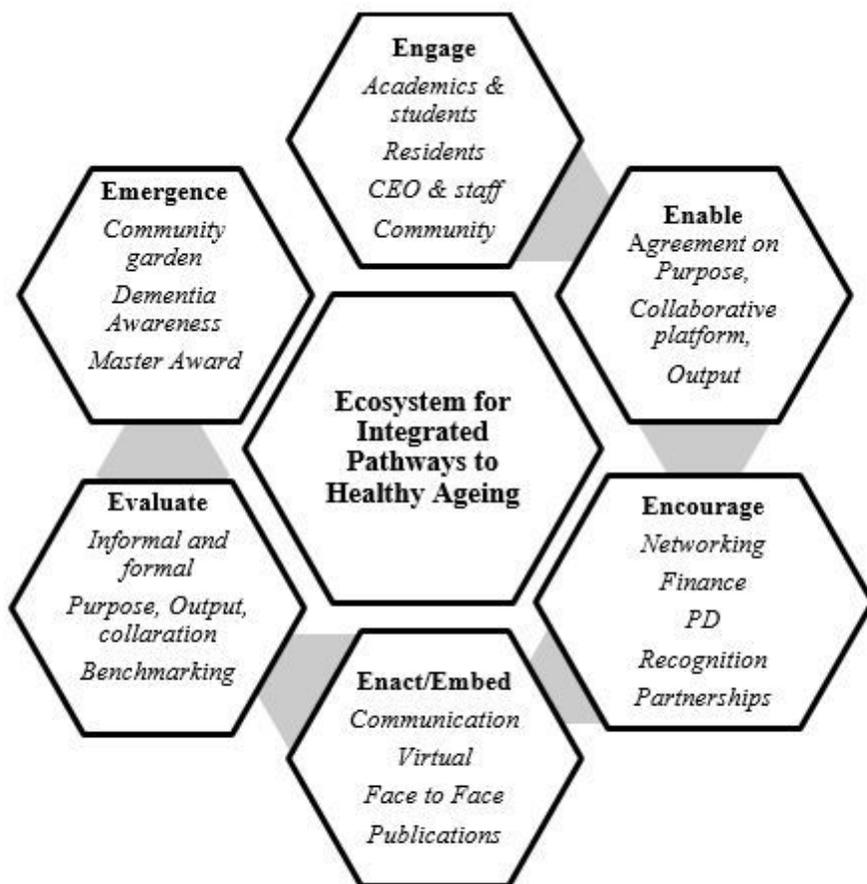
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Figures



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Figure 1

Conceptual Ecosystem for Integrated Pathways to Healthy Ageing