



Concept Paper

Development and Peer Review of an Evidence-Based Decision-Support Tool for Non-Drug Prescribing for Healthy Ageing

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Abstract: Introduction: Promoting healthy ageing is increasingly important to maintain functional ability and wellbeing in older age. However, there is a lack of consolidated evidence-based information to support the selection of non-drug interventions to support healthy ageing outcomes for individuals. Methods: A narrative review of the evidence-based literature on non-drug interventions to support healthy ageing was performed. Evidence for intervention benefits was evaluated and mapped into the Systematic Wellness Intervention Pathway framework and aligned to relevant goals, needs and outcomes relating to physical fitness and function, emotional wellbeing, cognitive health, sleep and diet and nutrition. Comments from a modified Delphi survey of 75 expert peer reviewers were analysed to inform the development of the next Pathway iteration. Results: The narrative review identified key healthy ageing interventions, including physical activity, social interaction, interventions for emotional wellbeing, creative and cognitively stimulating activities and diet and nutrition. Peer review survey results indicated majority agreement with all domains and non-drug interventions for healthy ageing in the Pathway, and suggested interventions and outcome revisions informed Pathway iteration. Conclusion: The Pathway could be a step forward in operationalising the delivery of non-drug interventions in an accessible and scalable way, supplementing conventional health and social care, to enable older people to live well for longer.

Keywords: healthy ageing; physical fitness; mental health; cognitive health; systematic approach; healthy ageing pathway; digital health; decision-support tool



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1. Introduction

In 2020, amidst a global pandemic, the United Nations and World Health Organization declared 2021 to 2030 as “The Decade of Healthy Ageing” with healthy ageing defined as “the process of developing and maintaining the functional ability that enables wellbeing in older age” [1]. This was a welcome focus for older people for whom health inequalities were increasingly evident as the pandemic progressed. However, impaired access to key elements of maintaining physical, cognitive and mental wellbeing persisted for many, including reduced access to acute and chronic healthcare, physical activity, healthy eating, socialisation, stress modification and cognitively stimulating activities [2,3]. The repercussions included physical deconditioning, reduced mobility, impaired confidence, weight gain or loss, loneliness, cognitive decline, and deteriorating mental health [4–6]. Motivation, already an area of challenges as populations age, was increasingly countered by fear, isolation and lack of interaction [7]. Closures of organisations and recreational groups meant fewer opportunities for active participation. Capability due to physical and psychological deconditioning diminished. As a result of the impact on these three key areas for behaviour change (Capability, Opportunity, and Motivation), engagement with healthy

behaviours understandably lessened [8]. However, these also remain challenges for all aspects of maintaining health and wellbeing even despite COVID-19 declining.

The ageing population and increasing life span pose significant socio-economic pressure on care systems [9]. Strategies to encourage lifestyle measures and health-promoting activities are essential for preventing non-communicable diseases, preventing frailty, and increasing health span, the part of a person's life in which they can enjoy in good health [10,11]. At the onset of the pandemic, most organisations had to rapidly adopt the digital delivery of health, social care and recreational programmes [12,13]. However, most digital interventions for maintaining health and wellbeing focused on very specific conditions or outcomes, or relied on a relatively small group of practitioner-specific interventions which may not be specific to the individual needs of the person or ageing process. Though awareness of social prescribing and measures such as lifestyle medicine is increasing [14,15], healthcare professionals may not have the time, knowledge and awareness of all the non-drug interventions available to suit a specific individual based on their needs, goals and preferences. Social prescribing link workers have been brought into the healthcare service, yet as with shortages of other health and social care resources [9], there is the need to have more widely available evidence-based information to support non-drug options for health maintenance and disease treatment.

Just as medication formularies and guidelines have been created and integrated into electronic health records and health systems, given the clear evidence-based benefits of non-drug interventions, decision-support information should include physical activity, stress management, healthy eating and promoting good sleep, to name a few. Healthy ageing frameworks have to date focused on domains of healthy ageing, including physical capability, physiological and metabolic health, psychological wellbeing (mental health), cognitive function, and social wellbeing [16,17]. Determinants of healthy ageing identified by researchers include physical activity, diet, self-awareness, outlook or attitude, life-long learning, faith, social support, financial security, community engagement and independence [16]. As an organisation focusing on delivering non-drug interventions and activities for older people, we could identify no clear decision-support resource that could address all the domains supportive of healthy ageing for those over 50, namely physical fitness, emotional wellbeing, cognitive health, as well as sleep and diet and nutrition. We, therefore, developed a Systematic Wellness Intervention Pathway for Healthy Ageing (or Pathway) as a reference tool to support providers and people in the selection of non-drug interventions to meet the needs and goals of those who want to engage in evidence-based activities to promote aspects of their physical, cognitive and emotional health and wellbeing. The Pathway is also intended to be integrated into a healthy ageing digital health and wellbeing platform that delivers online classes and programmes to support healthy ageing. The Pathway includes an extensive list of evidence-based non-drug interventions mapped to potential goals, needs and outcomes of older people. By wellness, we mean "the active pursuit of activities, choices and lifestyles that lead to a state of holistic health" [18]. In terms of healthy ageing outcome domains, we have included aspects of physical function and fitness, prevention of cognitive decline, positive mental wellbeing, stress reduction, sleep and nutrition. The development process included a narrative review of the literature for interventions aimed at health promotion and maintenance in older people, an extensive peer-review survey by 75 global experts in domains of healthy ageing and iterations of the Pathway based on expert input and newly identified evidence at update.

2. Methods

An initial list of topics covering the health domains and non-drug interventions was developed based on expert clinical knowledge and an initial scoping search of the published literature on healthy ageing. A narrative review was then conducted by two researchers through hierarchical searches of evidence-based literature for healthy ageing interventions for guidelines, systematic reviews and meta-analyses, randomised controlled trials, reviews, and observational studies published in the English-language literature in

the last 15 years on the various non-drug interventions identified as supportive to healthy ageing for a population. Where available, evidence for the population aged 50 years was sought; however, it is noted that the age range for “older people” varies between sources (United Nations: aged 65 and older; World Health Organisation: aged 55 or 60 years and older depending on region) [1,19–22]. Where evidence was not specifically available for the older population, we looked to evidence for the general adult population aged 18 years and older, as well as other types of literature in reviews, and other study types were considered. The focus of the literature and current version of the Pathway was on the maintenance of health and prevention of conditions focused on the domains of physical fitness and function, emotional wellbeing, cognitive health, sleep, and diet and nutrition. The literature was evaluated and graded based on the demonstrated level of impact (mild, medium, strong) as demonstrated in the literature. The evidence type (e.g., guideline, systematic review, randomised controlled trial, observational trial) and evidence level (low, moderate, high) were also noted and graded.

The initial list of non-drug interventions, identified evidence and grading was presented for review to an expert panel including a geriatrician, neuroscientist, clinical psychologist and public health specialist who reviewed and provided feedback through answering specific questions and provided written comments on the method of evidence search, appraisal and scoring, listed health domains and non-drug intervention categories. The full list of health domains, goals and needs, non-drug interventions and outcomes were then mapped into tables outlining the Pathway framework for further expert review (see Section 3 Results).

To ensure completeness and validity of the approach and to inform further iteration of the Pathway for healthy ageing, a modified Delphi survey was conducted to peer review the Pathway with 75 global experts in domains of healthy ageing. These experts were identified through the globally published literature on healthy ageing, expert listings at academic and healthcare organisations, collegial recommendations and referrals. Experts were contacted via email with introductory information about the peer review project and invited to participate. Expert reviewers were in the fields of research and academia, geriatric medicine, gerontology, psychiatry, psychology, public health, primary, secondary and tertiary healthcare, nursing, neuroscience, dementia, physiotherapy, health coaching, nutrition, fitness, sports science, women’s health, environmental design, social sciences and philosophy. Informed consent was obtained through a digital peer review agreement, and peer reviewers were provided with a background information document, a table summary of the pathway content and a survey questionnaire provided online through Microsoft Forms. Reviewers provided qualitative written responses to questions relating to sections of the Pathway, including the domains of healthy ageing covered, the specific needs noted, and the interventions listed for specific needs and outcomes. Reviewers were asked to comment if they felt the listed information was accurate to healthy ageing and to suggest additions and amendments to the summarised Pathway information. The free-text answers to the survey questions were analysed, and the frequency of noted topics or comments was divided into themes. While all comments were carefully reviewed, those that received the most frequent comments are noted below. Recommended improvements or updates were reviewed, and information about further studies or evidence was noted and checked.

While 30 expert reviewers were from the UK, the remainder were from a wide geographic distribution to provide a global perspective on the Pathway, as outlined in Table 1 below.

Table 1. Geographical distribution of expert reviewers.

Country	No. of Reviewers from Country
United Kingdom	30
Australia	11
United States of America	6

Table 1. *Cont.*

Country	No. of Reviewers from Country
South Africa	5
Mexico	3
Ireland	3
Italy	2
Kenya	2
Netherlands	2
Nigeria	2
New Zealand	1
United Arab Emirates	1
Lebanon	1
Israel	1
Iran	1
Estonia	1
Norway	1
Singapore	1
Portugal	1

3. Results

Results of the narrative literature review identified key domains for health and wellbeing in healthy ageing as well as activities and intervention categories, including physical activity and exercise, as well as creative, cultural, emotional, cognitive and dietary interventions for which the evidence of benefit for physical, emotional and cognitive health was assessed.

The healthy ageing goals and needs within each domain were identified, and relevant interventions, recommendations and outcomes were mapped from the evidence-based literature in a table framework. In particular, we considered interventions that could be delivered online or readily in the community for person-led self-management and support by trained providers without the specific need for medical intervention.

Feedback from the expert survey on the domains covered within the Pathway showed that 47/75 (63%) of reviewers agreed that the broad domains of physical fitness, emotional wellbeing, cognitive health and diet and nutrition covered the main general domains of healthy ageing and provided positive feedback on the Pathway overall. However, 41/75 (55%) of reviewers suggested an addition of a specific domain covering social connection and loneliness from responses on the different sections of the Pathway. Sleep was also separated into its own domain. Significant criticism only came from one reviewer, who felt it was not systematic but agreed it was an excellent idea. Disease and chronic conditions decision-support pathways for non-drug interventions are planned for future work as adjunctive support to medical and surgical interventions.

Table 2 shows the general domains, categories, goals and outcomes considered within the Wellness Intervention version of the Pathway aimed at the maintenance of healthy ageing and prevention of chronic conditions.

While it is beyond the scope of this paper to discuss every intervention listed within the Pathway, the key intervention categories and examples of interventions are discussed below.

Table 2. General healthy ageing domains, categories, goals and outcomes considered within the Systematic Wellness Intervention Pathway for Healthy Ageing.

Domains	Categories	Goals (Based on Identified Needs)	Targeted Outcomes	
Social Wellbeing	Ways to enhance positive social interaction and encourage social participation should be considered across all interventions e.g., through group-based and participative activities		Social participation Engagement in group-based activities Social connectedness Loneliness	
	Physical fitness and functional capacity	Mobility	Engage in activities appropriate to mobility and enhance functional mobility	Engagement in activities appropriate to mobility Engagement in physical activities Levels of sedentary activities Functional mobility Physical functional capacity Levels of cardiovascular fitness
		Physical Activity	Increase and maintain levels of fitness and physical activities. Improve and maintain strength, balance and flexibility Reduce risk of falls Encourage social participation	Endurance Strength Balance Flexibility Risk of falls Falls Bone mineral density Frailty
	Emotional Wellbeing	Stress	Engage in activities to reduce perceived stress and increase resilience Decrease perceived levels of stress Increase levels of happiness and subjective wellbeing.	Engagement with stress-modifying activities Perceived levels of stress Levels of happiness Subjective wellbeing Engagement with confidence-boosting activities
		Self-confidence	Improve self-confidence or self-esteem Engage in activities to promote self-confidence	Levels of self-confidence or self-esteem Sense of achievement Frequency of positive social interaction
		Mood	Engage in activities that promote positive mood and emotion Improve mood Reduce sense of anxiety	Engagement with activities to promote positive mood and reduce symptoms of anxiety Engage in group-based activities
	Sleep	Poor quality or insufficient sleep	Improve or maintain sleep quality and duration Improve or maintain daytime alertness Increase or maintain engagement in activities to promote sleep	Frequency of engagement in activities to promote sleep Sleep quality Sleep duration Daytime alertness Sleep routine Sleep environment
	Cognitive Health	Maintenance of cognition Maintenance of specific cognitive domains	Address modifiable risk factors for cognitive decline Improve or maintain attention, memory and learning, processing speed, language, visuospatial cognition, executive function, co-ordination, sensory	Engagement with activities to promote cognitive reserve and specific cognitive domains Modifiable risk factors for cognitive decline Measures of attention, memory and learning, processing speed, language, visuospatial cognition, executive function, co-ordination, sensory
Diet and Nutrition	Dietary intake and nutrition Overweight or obesity Underweight or malnutrition.	Dietary intake Healthy weight management Food access and preparation Reduce excess consumption Stop smoking	Dietary intake (vegetables, fruit, protein, fat, fibre, liquids) Weight Height Body composition Healthy food and meal access Alcohol intake Smoking Sarcopenia risk Osteoporosis risk	

3.1. Interventions for Social Wellbeing

It is clear that both social isolation and loneliness have detrimental health and mental wellbeing outcomes [23–25]. Interventions for loneliness can include improving social skills, strengthening social support, increasing the potential for social contact and addressing issues with social cognition [26,27]. Engagement in group-based activities is a regular recommendation, with art programmes showing promise and regional guidelines recommending involvement in community groups, e.g., through singing [28,29].

With the notable importance of social interaction and participation in promoting healthy ageing, we added social wellbeing as an overarching domain across the other health domains to reinforce the importance of doing participative or group-based activities or interventions to promote social interaction, which is something our organization encourages both in the online programmes and offline within communities.

3.2. Interventions for Physical Fitness and Function

Evidence and guidance for physical activity for all adults, including those aged 65 and older, is clear regarding benefits and comparatively low risks [22,30,31]. In the physical fitness and function section of the Pathway, we further considered physical activity and exercise interventions (Table 3).

Cardiovascular (aerobic) physical activity can include movement activities as well as planned exercise such as workouts, sports, active games, walking, running, cycling, swimming, dancing, some types of yoga, active gardening, maintaining active movement at home or wheeling a manual wheelchair [22,30]. Physical benefits of cardiovascular physical activity for older people include improving cardiovascular fitness and endurance, preventing physical functional decline and falls, and preventing and managing health conditions [22,31,32]. Cognitive benefits of cardiovascular physical activities have been shown for global cognition, executive function and reducing the risk of cognitive decline [22,33–35]. Emotional benefits for older people include reducing symptoms of anxiety, reducing symptoms of depression and improving sleep [22,36]. Regular physical activity and reduction of sedentary activity should be encouraged across all generations. Guidelines recommend all adults should get 150 to 300 min of moderate-intensity physical activity per week or 75 to 150 min of vigorous-intensity physical activity per week [22,31,32].

Muscle-strengthening physical activity should be encouraged for all adults to improve and maintain muscle and bone strength. It may include strength training, resistance training, or muscular strength and endurance exercises [22]. There are additional health benefits to be gained by getting muscle-strengthening physical activity as part of a weekly exercise regimen [22]. Physical benefits for older people include improving muscular fitness and improving and maintaining muscle mass and bone strength [31]. The cognitive benefits include the maintenance of global cognition and executive function [35,37]. Emotional benefits for older people include reducing symptoms of depression and anxiety [38,39]. Guidelines recommend that all adults should get muscle-strengthening exercise at least two days each week, at moderate or greater intensity, involving all major muscle groups [22,31,32].

Multicomponent physical activity combines balance, strength, gait, and functional training [22]. It can include varied workouts, Tai Chi Chuan, dancing, Yoga, or activities such as heavy gardening, which incorporate movements for balance, strength, and flexibility. Physical benefits for older people, especially those aged 65 and older, include improving balance and functional capacity, reducing risks of falls, improving bone health and preventing osteoporosis [22,32]. Tai Chi, Yoga and Pilates incorporate movement as well as breathing routines and have also been shown to improve mental wellbeing and quality of life and reduce symptoms of anxiety and depression [40–44]. Cognitive benefits in doing Tai Chi, Yoga or Pilates are demonstrated for executive and global cognitive function [35,37,45–47]. Guidelines recommend that people aged 65 or older, as part of their weekly physical activity, should do varied multicomponent physical activity that focuses on functional balance and strength training, at moderate or greater intensity, on three or

more days a week [22,31,32]. Specific exercises focused on improving and maintaining balance can help to maintain physical function and reduce risk of falls and injury from falls. Improving and maintaining the flexibility of the joints to move through a full range of motion can be achieved through stretching [31].

Chair-based exercise or seated exercise can be a useful way for older people to engage in exercise programmes if they are less able to take part in standing and floor-based exercise classes. During a chair-based exercise class, participants remain seated in a sturdy upright chair or in their own mobility aid, such as a wheelchair. Physical benefits for older people with frailty include improving muscle strength, cardiovascular fitness and mobility and reducing risks of falls [48,49]. While there are noted mental health benefits related to chair-based exercise [48,49], no cognitive benefits have yet been identified. It is, however, important not to discourage engagement in exercise that could improve balance and mobility and rely solely on chair-based exercise if balance could be improved through other means.

Table 3. Physical fitness and functional capacity domain displaying relevant categories, goals, non-drug interventions and outcomes.

Physical Fitness and Function			
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions (Person-Centred Choice from List)	Targeted Outcomes (Self-Assessed or Measured)
Mobility	Activity while restricted to bed	Bed-based exercises Occupational therapy Physiotherapy	Mobility status change Physical activity frequency, intensity, duration, types, preferences Functional ability
	Activity with reduced mobility (e.g., restricted to chair, wheelchair user, physical disability, temporary injury or recovery)	Chair-based exercise [48,49] Supported exercise	Functional fitness questions & tests: strength, flexibility, agility, aerobic fitness. Falls risk
	Activity to maintain usual unrestricted mobility	Any physical activity, exercise, fitness classes [22,30–32].	
Physical activity and fitness	Reduce sedentary activity Start physical activity Improve low level fitness	Light to moderate cardiovascular exercise Chair-based exercise Entry level and easy workouts Introductory workout classes	
	Increase physical activity duration or intensity Maintain physical activity duration or intensity Improve low level fitness Maintain moderate level fitness	*Cardiovascular (aerobic) physical activity: walking, running, dancing, sports, active games, cycling, swimming, some types of yoga, active gardening, wheeling a manual wheelchair, any aerobic exercise workout classes [22,30–32,50,51] All above and moderate level workouts. Aiming for aerobic physical activity but levels of [22,31,32]: Moderate intensity at least 150 min per week Vigorous intensity at least 75 min per week	Aerobic physical activity frequency, intensity, duration, types, preferences Fitness level: self-assessed Functional ability Functional fitness questions & tests: strength, flexibility, agility, aerobic fitness. Falls risk Levels of happiness, stress, mood, sense of wellbeing, energy, fatigue Cognitive ability (maintenance of cognition and executive function) Sleep quality, duration Pelvic floor function Bone density Health-related quality of life Quality of life
	Increase physical activity duration or intensity Maintain physical activity duration or intensity	Continue with Cardiovascular (aerobic) physical activity as listed at * above [22,30–32]. Moderate Level workouts High Intensity Workouts Aiming for aerobic physical activity with levels of [22,31,32]: Moderate intensity 150 min or more per week Vigorous intensity 75 min or more per week	
	Improve moderate level fitness Maintain high level fitness		

Table 3. Cont.

Physical Fitness and Function			
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions (Person-Centred Choice from List)	Targeted Outcomes (Self-Assessed or Measured)
	Increase muscle- and/or bone-strengthening physical activity to at least 2 sessions per week Maintain muscle- and/or bone-strengthening physical activity to at least 2 sessions or more per week Improve muscle and bone strength Maintain muscle and bone strength Target area strength: Improve Upper limb (arm) strength Improve lower limb (leg) strength Improve back strength Improve core muscle strength	Aiming for 2 or more sessions muscle-strengthening activities per week at moderate or greater intensity [22,30–32] For those new to exercise suggest Entry Level Workouts, Introductory Pilates, Yoga For those already engaged in muscle-strengthening activity, continue with moderate to intense level workouts, Pilates, Yoga Arm-strengthening exercises Leg-strengthening exercises Back-strengthening exercises Core strengthening exercises, Targeted Core Workouts, Pilates	Muscle-strengthening session frequency, duration, intensity, activity types, preferences Multicomponent physical activity types, intensity, frequency, duration, preferences Functional ability: ADL, IDL, Barthel’s Functional fitness questions & tests: strength, flexibility, agility, aerobic fitness. Falls risk Levels of happiness, stress, mood, sense of wellbeing, energy, fatigue Cognitive ability (maintenance of global cognition and executive function) Sleep quality, duration
	Aged 65+: Increase multicomponent exercise sessions to at least 3 per week. Maintain multicomponent exercise sessions at 3 or more per week. Maintain or improve balance Maintain or improve flexibility Reduce the risk of falls Improve balance Improve flexibility	Aim for 3 or more sessions multicomponent exercise a week including Entry Level Workouts, Moderate Level Workouts, Tai Chi, Yoga, Pilates, Dance [22,31,32] Balance exercises, Supported Exercise, Seated Exercise [48,49] Mobility classes, Massage, Yoga, Tai Chi, Pilates; Stretching, target area flexibility, mobility classes [22,31,32,52]	Multicomponent exercise session frequency, duration, intensity, activity types, preferences Balance questions & tests Flexibility questions & tests Falls risk assessment

Expert feedback on the physical fitness and function section of the Pathway noted the addition of sexual health, smoking and fear of falls as the most frequently noted comments from four reviewers (5%), each within each category. The addition of gait and posture assessment were deemed important by three reviewers (4%) each. These recommendations also accompanied the recommendation for the addition of frailty assessment within the Pathway by seven reviewers (9%). These will be considered for future condition-focused musculoskeletal pathways. The most frequently recommended non-drug interventions to add were gardening and specific exercise to promote balance. Activities of daily living and movement around the home, e.g., stair climbing or housework, were also proposed as physical activity additions. Qiqong was recommended for both benefits of mood and also as a potential bed-based exercise. In terms of additional outcomes, the addition of a frailty score, hand grip strength, steps per day and technology to measure heart rate variability were the more commonly suggested additions.

3.3. Interventions for Emotional Wellbeing

There are a number of activities and interventions that benefit emotional wellbeing that have already been covered in the social wellbeing and physical activity interventions, the categories of which are both encouraged for benefits on physical and mental health [22,36]. In the emotional wellbeing section of the Pathway, we further considered interventions and activities that can benefit mood, stress management and self-confidence (Table 4).

Mindfulness-based interventions and meditation use different mind–body approaches to cultivating sustained attention on a background of non-reactivity and acceptance [53,54]. Interventions using mindfulness-based stress reduction and mindfulness-based cognitive behavioural therapy have been shown to have beneficial effects on improving sleep, enhancing mood, reducing symptoms of anxiety and depression, improving memory and executive functioning and reducing loneliness [53,55–57]. Older adults who have taken part in mindfulness-based programmes stated that they noted increased awareness and self-reflection and felt more self-accepting, as well as an improved sense of wellbeing and

quality of life [56–58]. It was also noted that they engaged in healthier habits to take care of themselves and felt that they experienced better relationships with family and friends [58].

Massage, reflexology and breathing techniques help to focus on relaxation [52,59,60]. The use of breathing techniques is noted to be helpful in decreasing perceived levels of stress and anxiety [61]. Massage has also been shown to have a mild beneficial impact on quality of life, pain, sleep, emotion and psychosocial health and has been associated with fewer limitations due to physical issues [52,60,62].

Cognitive behavioural therapy is a psychological approach to improving mental health that helps a person to change the way they think about negative aspects of their lives, improve the way they sense emotions and help to teach skills and coping strategies to better deal with problems and challenges [63]. It has been shown to be effective in anxiety, depression and insomnia. Yoga-CBT is a blend of yoga movement and breathing accompanied by the principles of cognitive behavioural therapy and has been shown to reduce symptoms of anxiety [64].

Positive psychology approaches and techniques can help focus on the more optimistic and pragmatic approaches to reducing the sense of stress and anxiety [65]. Journaling is one technique that can help reduce the impact of stress.

Health coaching is increasingly being promoted as a motivational tool to assist people in meeting their health and wellbeing goals and has been shown to significantly increase participation in physical activity [66]. The evidence for the efficacy of digital health coaching is growing [67].

Many activities and interventions that are creative and intellectually stimulating also have positive benefits for emotional wellbeing and mental health. These can include music, art, reading, learning and social connection, and these are covered in more detail in the cognitive health section.

In terms of the expert review of the emotional wellbeing domain, the addition of spiritual life, as well as finding purpose, were highlighted by 10 (13%) and 7 (9%) reviewers, respectively. With the strong recommendation for specific inclusion of social participation and loneliness, a specific category was introduced to the emotional wellbeing domain. Despite noting in the instructions that specific health conditions or mental health would be considered in future condition-specific pathways, there was a strong emphasis on including depression and anxiety from 15 (20%) to 12 (16%) reviewers, respectively, with a further 8 reviewers noting topics of low mood, mood, mental health overall and sadness as specific needs to consider. While the specific non-drug management of the specific conditions of anxiety and depression will be considered for future versions, a section on mood to cover reducing anxious feelings and maintenance of positive emotions was suggested. In terms of social interventions, doing activities with other people, group-based exercise, encouraging social interaction, improving social skills, enhancing social support, increasing opportunities for social contact and addressing maladaptive social cognition were proposed [26]. Breathing techniques for the management of stress were noted by four (5%) reviewers. Developing or finding a sense of purpose was noted by two (3%) reviewers, and promoting gardening for emotional wellbeing by a further two (3%) reviewers. Emphasis on including quality of life assessments was the most frequently noted emotional outcome, although these were already listed in the Pathway outcomes.

Table 4. Emotional wellbeing domain displaying relevant categories, goals, non-drug interventions and outcomes.

Emotional Wellbeing			
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions (Person-Centred Choice)	Targeted Outcomes (Self-Assessed or Measured)
Stress: Increased levels of perceived stress	Increase physical activity alone or accompanied by: Reduce impacts of stressful life or daily events Improve poor or inadequate sleep Improve levels of happiness	Regular physical activity and exercise [22,68,69] Mind-body exercises (Tai Chi, Yoga, Pilates) [40–44,70]	Physical activity and exercise type, frequency, intensity, duration. Stress-moderating activities, type, frequency, duration. Levels of perceived stress Levels of happiness Levels of calmness Levels of self-confidence Sense of achievement Subjective wellbeing Quality of life Life satisfaction Sleep quality and duration Dietary and substance intake including vegetables and fruit intake, alcohol, smoking Frequency of positive social interaction Perceived sense of loneliness Social connection Sexual health outcomes
	Increase stress moderating activities. Reduce impacts of stressful life or daily events Increase levels of happiness Decrease levels of worry Increase subjective wellbeing Improve poor or inadequate sleep Increase quality of life Increase life satisfaction Reduce sense of loneliness Increase social connectedness Improve sexual health	Mindfulness-based stress reduction & Meditation [53–58,70–72] Relaxation techniques [60,61] Singing [73–78] Music listening [73,76,79,80] Manual therapies including massage, reflexology, aromatherapy [52,59,60,81,82] Positive Psychology and related activities and tools [65] Creative activities: Art, writing, reading, crafts [78,83–86] Reading [87–93] Coaching (health coaching, life coaching) [66,94] Learn something new [95–97] Healthy eating [98–102] Developing sense of purpose [16,103–108] Social participation [26–29] Spiritual life [16] Grief counselling [109] Cognitive behavioural therapy [63] Counselling [110] Psychotherapy [111] Financial advice [16]	
Self-confidence and self-esteem	Improve levels of self-confidence +/-: Increase confidence-promoting activities Increase levels of self-efficacy Increase levels of happiness Increase sense of achievement Increase subjective wellbeing Increase quality of life Increase life satisfaction Reduce sense of loneliness Increase social participation Improved sexual health	Coaching (health coaching, life coaching) [66,94] Cognitive Behavioural Therapy skills and techniques [63] Positive psychology skills and techniques [65] Developing sense of purpose [16,103–108] Spiritual life [16] Group Counselling [109] Counselling [110] Psychotherapy [111]	Confidence-promoting activities type, frequency, duration. Levels of self-confidence Levels of self-efficacy Levels of happiness Sense of achievement Subjective wellbeing Quality of life Life satisfaction Frequency of positive social interaction Perceived sense of loneliness Social connection Sexual health outcomes
Mood	Reduce symptoms of anxiety Improve mood Increase positive emotions Increase levels of happiness Increase subjective wellbeing Increase life satisfaction Reduce sense of loneliness Increase social participation Improved sexual health	Regular physical activity and exercise [22] Mind-body exercises (Tai Chi, Yoga, Pilates) [40–44] Mindfulness-based stress reduction & Meditation [53–58,70–72] Singing [73] Music listening [73,76,79,80] Manual therapies including massage, reflexology, aromatherapy [52,59,60] Positive Psychology and related activities and tools [65] Creative activities: Art, writing, reading, crafts [78,83–85] Gardening [50,51] Reading [87–92] Coaching (health coaching, life coaching) [66,94] Learn something new [95] Healthy eating [98–102] Developing sense of purpose [16,103–108] Social participation [26–29] Spiritual life [16] Cognitive behavioural therapy [63] Counselling [110] Psychotherapy [111]	Physical activity and exercise type, frequency, intensity, duration. Levels of perceived stress Levels of happiness Levels of calmness Levels of self-confidence Sense of achievement Subjective wellbeing Quality of life Life satisfaction Sleep quality and duration Dietary and substance intake including vegetables and fruit intake, alcohol, smoking Frequency of positive social interaction Perceived sense of loneliness Social connection Sexual health outcomes

3.4. Interventions for Sleep

Short duration or poor-quality sleep has been shown to impact physical, cognitive and mental health [112]. Non-drug interventions supportive of sleep include improving the sleep environment, regular daytime physical activity, exposure to morning sunlight, mind–body type exercises such as Tai Chi or Yoga and relaxation practices in the later part of the day or before bed [22,36,113–115]. In the sleep section of the Pathway, interventions and activities supportive for sleep quality and duration are listed (Table 5).

Expert comments in the survey related to sleep suggested the addition of excess sleep, as noted by four (5%) reviewers. Regarding interventions, morning outdoor sunlight was noted to be important to support sleep by three (4%) reviewers and adjustment of the sleep environment by two (3%) reviewers. Fluid consumption that may impact waking and the noted Pittsburgh Sleep Quality Index assessment for sleep were listed [116]. Given the significant impacts of sleep on health, sleep was also subsequently assigned to its own domain in the Pathway.

Table 5. Sleep domain displaying relevant categories, goals, non-drug interventions and outcomes.

Sleep			
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions (Person-Centred Choice)	Targeted Outcomes (Self-Assessed or Measured)
Sleep poor quality or insufficient	Improved sleep time Improved sleep quality Sense of refreshment on waking Decreased daytime sleepiness Increased cognitive focus Increased energy levels Reduce excess sleep	Sleep specific non-pharmacological interventions: education, sleep hygiene, cognitive behavioural therapy [117–120] Afternoon/evening mindfulness-based stress reduction and meditation [117] Afternoon/evening relaxation [60] Manual therapies (reflexology, massage, acupressure, aromatherapy) [121–124] Music [73] Nutritional: reduce caffeine, alcohol, stimulants [125]	Sleep-promoting activities frequency, duration Physical activity and exercise type, frequency, intensity, duration, timing Sleep duration Sleep quality Level of refreshment on waking Daytime sleepiness Levels of perceived stress Levels of cognitive focus Energy levels Subjective wellbeing Quality of life Life satisfaction Sleep-related diet factors: intake caffeine, alcohol, stimulants; evening meal, snacks
	Need for more physical activity alone with one or all needs listed in block above.	Regular physical activity and exercise [22,36,113–115,126] Mind–body exercises (Tai Chi, Yoga, Pilates) [127–132]	

3.5. Creative and Cognitively Stimulating Interventions and Cognitive Health

Many interventions and activities have been shown to benefit multiple domains of health, including physical activity, social interaction, a healthy diet and adequate sleep, which have also been shown to have beneficial impacts on cognitive health and prevention of cognitive decline. In this section of the Pathway, we consider additional interventions and activities that have been shown to benefit cognitive health (Table 6).

Reading is an enjoyable cognitive leisure activity that has been shown to benefit both cognitive and emotional wellbeing through intellectual, cognitive stimulation activating various parts of the brain [87–92]. Cognitive benefits of reading include reducing cognitive decline, maintaining cognitive abilities and preventing dementia [133–135]. Reading has also been shown to benefit emotional wellbeing, reduce stress and feelings of depression, and increase social awareness and connectedness [89–91,93].

Visual arts include painting, drawing, crafts, design, photography, sculpture and textiles [78]. Engagement in the arts involves creative imagination, appreciation of beauty,

activation of the senses, arousal of emotion and cognitive stimulation [78,85]. Art-based activities have been shown to contribute to self-discovery and self-expression; benefit relationships, social interaction and connection; and give a sense of achievement in creating and discovering new creative skills while enhancing the sense of wellbeing and social connection [78,83–85]. Training in visual art has also been shown to be associated with short-term improvement in visual processing and auditory response [136].

Music and singing is an activity that has been shown to be beneficial to the health and wellbeing of older people [73]. Physiologically, singing involves breath control, rhythm, memory and good posture [74]. Singing has been shown to improve lung capacity and breathing muscles [78]. Choir or group singing is a popular activity that also shows benefits for mental and social health in older adults [75]. Singing has also been shown to reduce a sense of loneliness and improve social bonding [78,137]. In healthy older people, singing has been shown to enhance morale, improve mood, reduce symptoms of anxiety or depression, reduce the risk of depression and reduce the sense of loneliness [74,76–78]. Music listening has been associated with reducing symptoms of depression, improving psychological wellbeing and increasing positive emotion [76,79,80].

Within the cognitive health part of the expert survey, attention was drawn to hearing and vision loss, and management was the main theme within five (7%) of the reviewer comments. In terms of intervention, work or walking in the garden was noted by three (4%) reviewers, and technological solutions or assistive devices were noted by a further three (4%) reviewers. Being challenged and developing or finding a sense of purpose were noted by two reviewers each. With some reviewers noting that cognitive testing can be challenging, one helpful suggestion was that doing a self-report on the satisfaction of performance of cognitive domains may be a helpful form of self-assessment.

Cognitive health was deemed to be the most comprehensive domain covered overall by the reviewers, but useful additions of activities for specific domains were helpful. Again, socialisation was emphasised for the benefits of cognition, with recent research supporting the cognitive benefits of positive and regular social interaction in older people [138].

Table 6. Cognitive health domain displaying relevant categories, goals, non-drug interventions and outcomes.

Cognitive Health			
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions (Person-Centred Choice from List)	Targeted Outcomes (Self-Assessed or Measured; Cognitive Tests as Part of Screening or Cognitive Testing)
Cognition (maintenance and prevention of cognitive decline)	Physical inactivity	Physical activity (aerobic physical activity, muscle-strengthening, Yoga, Tai Chi, Pilates) [22,33–35,37,45–47]	Physical activity frequency, duration
	Obesity	Nutrition, physical activity, coaching (see “Diet and Nutrition” Table)	See “Diet and Nutrition” Table.
	Social isolation	Social interaction [138,139]	Frequency and type (positive, neutral, negative) of social interaction; social isolation scales
	Lack of cognitively stimulating activities	Cognitive training [140,141] Learning and creating including art, painting, crafts, writing, music, singing, languages, cooking, formal learning [78,85,86,95–97,142–145] Reading books, articles, newspaper [133–135] Playing board games and card games [90,146,147]	Cognitive testing as part of cognitive training Cognitive activity types, frequency
	Increased levels of perceived stress	Physical activity and exercise Stress-moderating activities (See “Emotional Wellbeing”)	Level perceived stress

Table 6. Cont.

Cognitive Health				
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions (Person-Centred Choice from List)	Targeted Outcomes (Self-Assessed or Measured; Cognitive Tests as Part of Screening or Cognitive Testing)	
Specific cognitive domains	Attention	Attention	Number puzzles, word puzzles, chess [87,148–152] Writing, colouring therapy (e.g., Mandala) [78,85,136,153] Lavender aromatherapy (sustained attention) [154,155]	Cognitive measures of attention
		Sensory Memory (verbal, visual)	Song recollection games/quizzes, image recall games [156–158]	Verbal memory tests Visual memory tests
		Short Term Memory	Memory card games Visual image association	Short-term memory recall tests
	Memory and Learning	Working Memory	Working memory training [159,160] Mathematical problems, number puzzles, word puzzles Jigsaw puzzling, jigsaw puzzle imagery tasks, chess [87,148–152,161,162] Moderate intensity multicomponent or mind-body exercise [22,33–35,37,45–47] Social interaction [138,139]	Cognitive memory tests
		Episodic Memory	Reading, number puzzles, word puzzles, Jigsaw puzzles [92,133–135,148–150,161,162] Music [163] Social interaction [138,139]	
		Verbal learning	Writing [86]	
	Processing Speed		Writing, number puzzles, word puzzles, jigsaw puzzles, chess [86,87,148–152,161] Social interaction [138,139]	Cognitive measures of processing speed
	Language	Verbal fluency	Reading, Pilates, choir singing [75,92,133–135,162,164]	Cognitive measures of language: Verbal fluency
	Visuospatial cognition	Perception, constructional praxis, mental rotation, speed, flexibility, working memory, reasoning, and episodic memory.	Jigsaw puzzling, jigsaw puzzle imagery tasks, mathematical problems, chess [87,148–152,161,162]	Cognitive measures of visuospatial cognition
	Executive function	Planning, Problem Solving	Mathematical problems number puzzles, word puzzles, chess [87,148–152,162] Virtual clue games, trivia, quizzes, theoretical problem solving [90,146,147,165]	
		Judgement, Decision Making	Chess, number puzzles [87,150–152] Scenario-based challenges, history-based events, Writing and narrative creation. [78,86]	Cognitive measures of executive function
		Abstract thought	Interpret proverbs Describe differences between words	
		Verbal Flexibility	Choir singing [75]	
		Reasoning	Jigsaw puzzles [148,161]	
Co-ordination/ Motor speed and dexterity	Gross Motor	Cross dimensional brain activity, juggling, hand eye co-ordination activities, dancing, Tai Chi [166–168]	Cognitive measures of co-ordination	
	Fine Motor	Fine motor, singular dimensional process. Combination process fine motor functions [169]		

Table 6. Cont.

Cognitive Health			
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions (Person-Centred Choice from List)	Targeted Outcomes (Self-Assessed or Measured; Cognitive Tests as Part of Screening or Cognitive Testing)
	Sight Hearing Smell Taste Touch	Food preparation [170] Massage [170] Aromatherapy [170] Sensory gardens [170] Vision aids [29] Hearing aids [29]	Sensory measurements Sight and hearing checks

3.6. Diet and Nutrition Interventions

Diet and nutrition are increasingly being highlighted as essential interventions, in particular for metabolic and musculoskeletal health in later years, with inadequate nutrition contributing to conditions such as sarcopenia, frailty and reduced bone mineral density and the consumption of highly processed foods, salts and poor-quality fat contributing to hypertension, heart disease, type 2 diabetes and dementia [98–101]. The diet and nutrition section of the pathway considers the self-management activities that can support nutrition in older age. In this section of the Pathway, we summarise interventions and activities key for diet and nutrition (Table 7).

Cooking skills and knowledge of cuisine have an impact on food and nutritional intake [171,172]. Cooking skills could help to keep people interested in a wider variety of foods and help improve dietary and food choices [171,172]. Older people who have a low level of cooking skills are more likely to have unhealthier diets and food choices and tend to cook fewer meals at home [173]. In turn, having fewer cooking skills can contribute to eating fewer vegetables and fruits and being underweight [173]. Getting involved in food preparation and cooking seems to have beneficial effects on social interaction related to meals and coping with meals [174]. Not only do cooking skills help people know how best to prepare meals, but they also give them better awareness and knowledge of ready-prepared meal choices [172]. Cooking training has also been shown to show a short-term increase in executive functioning in the brain [143,144]. Executive functioning is the set of brain processes used to start and monitor tasks and include working memory, flexible thinking and self-control [22,34].

In diet and nutrition, underweight and malnutrition were the most frequently noted recommended additions, having been noted by 12 reviewers (16%) in total. The diet and nutrition domain had the most heterogeneous of all the comments, with two reviewers (3%) noting technological solutions and access to healthy food was noted by two reviewers (3%). The body measurement of BMI was noted, although weight and height were already listed with BMI calculation in mind. While body fat percentage and lean muscle mass can be helpful for body composition, they may not be as feasibly and reliably performed using remote technology.

Regarding updates to the diet and nutrition domain of the Pathway, being underweight or malnutrition had not been previously included as they were identified to warrant further investigation by a healthcare provider to evaluate for any underlying causes of being underweight, nutritional deficiencies or weight loss [175]. However, given the important associations between being underweight and sarcopenia, frailty and falls, we subsequently included a category of being underweight or malnutrition with the acknowledgement that local referral would be warranted if it was an identified need.

Table 7. Diet and nutrition domain displaying relevant categories, goals, non-drug interventions and outcomes.

Diet & Nutrition			
Category	Goals (Based on Identified Needs)	Suggested Non-Drug Interventions	Targeted Outcomes (Self-Assessed or Measured)
Inadequate intake	Adequate intake of vegetables and fruit Adequate intake of protein Adequate intake of fibre Adequate intake calcium and Vit D Adequate hydration	Information and education on age-specific healthy dietary intake based on national guidelines for energy, protein, saturated fat, mono- and polyunsaturated fats, trans fats, carbohydrates, free sugars, dietary fibre, salt, micronutrient intake. [98,176] Cooking skills Grow your own gardening Access to healthy food [98]	Daily (weekly) intake vegetables and fruit (5 or more portions a day), protein and types, dietary fibre, liquids, fats Food and hydration diary Sarcopenia risk Osteoporosis risk Healthy food and meal access
Over consumption	If overconsumption: Reduce consumption salt Reduce consumption caffeine Reduce consumption alcohol Reduce consumption free sugars Reduce consumption carbohydrates Reduce consumption highly processed foods Reduce consumption fat	Information and education on age-specific healthy dietary intake based on national guidelines for salt, caffeine, alcohol, free sugars, carbohydrates [98,176]	Daily (weekly) intake salt or high-sodium foods, caffeine, alcohol, free sugars, carbohydrates
Food preparation skills (functional ability and mobility intact)	Improve meal planning skills Improve food preparation and cooking skills	Shopping and meal-planning skills [174] Food preparation and cooking classes [171–174]	Frequency of home-cooked meals
Overweight or obesity	Weight management	Guided lifestyle healthy weight management program including: [177] Healthy dietary habits Physical activity and exercise Behavioural change Sleep and stress optimisation	Weight and height (BMI) Waist circumference Clothing size Indicators of behaviour change Personal goals Body fat percentage (if available) Lean muscle mass (if available) Food and lifestyle diary.
Underweight or malnutrition	Assess cause of underweight	Assessment with healthcare practitioner for further management	Information on public health nutrition recommendations for age. Healthy food and meal access Sign posting to general practitioner or health service for further evaluation and management.
Smoking	Stop smoking	Smoking cessation programmes [178]	Successful smoking cessation

4. Discussion

4.1. Key Findings of the Expert Survey

With no other identifiable evidence-based structured approaches to selecting non-drug interventions for a holistic bio-psycho-social multidomain approach to healthy ageing that includes physical, cognitive, emotional, sleep, nutritional and social aspects, there is a need for operationalized decision support and delivery to promote healthy ageing. The detailed modified Delphi survey comments, from professional experts working with

older people in a range of care and research settings, have been highly informative in the further development of the Pathway. Positive feedback has been encouraging on the overall approach, and constructive suggestions have been instrumental in improving the Pathway and expanding the interventions considered. Additional non-drug interventions noted by individual reviewers will be kept under consideration, and further surveillance of the evidence-based literature for potential inclusion in future versions and, of course, further Pathways will be developed to focus on specific conditions with depression and anxiety as a clear priority as demonstrated by the frequency of comments.

The results of the expert survey helped us to consider how we present the Pathway and its intended goals. Social interaction and addressing loneliness were factors that needed clearer emphasis within the Pathway, with 55% of the experts surveyed noting their importance. Positive social interaction and socially supportive relationships are widely shown to benefit healthy ageing and longevity [16,17,179]. However, social interaction is the one aspect of healthy ageing that evidence has yet to identify a required frequency, and strong evidence is lacking in terms of the exact type of social interaction [180]. Hence, the social interaction domain was incorporated as an overarching consideration bridging all other domains of health ageing to encourage the fundamental aspect of social interaction and peer support wherever possible in other group-based activities or for social interaction itself.

It is worth noting other social determinants of health which were identified as absent from the Pathway by a minority of the experts. We fully acknowledge the importance of health care and social care, finance and living environment factors for older people at a societal level [16] but have not focused on these specific aspects in the Pathway. The Pathway is intended to be used in conjunction with normal healthcare and social support within communities.

Disease and chronic conditions are planned for future pathways. Frailty was highlighted by seven of the expert reviewers. While often considered from a physical perspective, management of frailty requires a multidimensional approach to identifying and treating frailty and pre-frailty, and we felt the potentially complex multidisciplinary and face-to-face support frailty requires meant it best belonged in a dedicated frailty condition Pathway [181]. However, it is worth noting that the healthy lifestyle interventions widely recommended to prevent frailty are the same for most other chronic conditions and include being physically active, eating a healthy diet, maintaining a healthy weight, stopping smoking and reducing alcohol intake [182]. Having initially set out to build the Pathway with the intention of digital-first delivery with the community, we recognised that not all condition assessments and interventions could be delivered digitally with a high level of efficacy or adherence. Due to the significant contribution of frailty to disability and mortality in older people, early identification of frailty and its risk factors is crucial to provide early and accessible interventions to prevent further deterioration and the consequent impact on health span [183,184]. Encouragingly, web-based applications for frailty assessment are increasingly available for digital delivery enabling digital accessibility; however, further development is still needed in terms of key function [185]. It is also interesting to note that evidence for the benefits of exercise in frailty is strongest for group-based physical activity interventions [186]. We, therefore, included frailty in the latest iteration of the Pathway with the acknowledgement that these interventions may need to be referred to and arranged locally in person.

Gardening, also known as horticultural therapy, was a recommended addition by six of the experts to the non-drug interventions with some evidence supporting benefits for quality of life, anxiety, depression, social relations, physical effects, and cognitive effects [50,51,187]. Community gardening has shown physical and mental health benefits for both doing physical gardening as well as spending time in the nature of a garden [188]. This was a particularly pleasing addition to the authors, who admit a personal bias for the benefits of gardening with the potential for participants to share their creative and culinary outcomes. While not specifically a digitally delivered intervention, aspects around

information and knowledge on gardening are already popular in media content and are certainly amenable to being delivered online.

In terms of emotional wellbeing, the emphasis from the expert survey response on anxiety and depression was notable despite indicating that the Pathway was intended for maintenance and prevention and not the management of specific conditions. It is, of course, acknowledged that mood disorders may all start somewhere on a spectrum of severity pre-diagnosis and that people may experience symptoms of anxiety or low mood without having a diagnosis of a mental health condition. As a result, a specific mood section was added to the next iteration of the Pathway in the interest of listing useful interventions to promote positive emotions and reduce the sense of anxiety outside of diagnosed mood disorders. In addition, the highlighted importance of spiritual life and purpose by the expert reviewers for health, wellbeing and longevity was acknowledged to be an important addition to the Pathway [16,103–108].

4.2. Pathway Purpose and Next Steps

4.2.1. Person-Centred Choice of Non-Drug Interventions

Healthy ageing is increasingly recognised and promoted within many populations and communities [1,189]. From the perspective of an older person, while useful information is available to promote health literacy around interventions for healthy ageing, there is a profusion of health and wellness activities for people to choose from, both evidence-based and non-evidence-based. Many health and wellness offerings deliver only unimodal interventions or are focused on only one health domain goal, e.g., increased fitness, better sleep or management of stress. It is our experience that it can be overwhelming for people when choosing interventions to promote health behaviour change that supports more than one health domain. In addition, we have observed that more generic health information resources do not offer the functionality for people to refine their choice of interventions or activities based on their personalised health goals and the specific physical, cognitive and emotional health and wellbeing evidence demonstrated in the published literature. Having a tool such as the Systematic Wellness Intervention Pathway that can provide a method of filtering and prioritising the non-drug intervention options for people to meet their specific health goals can offer a more personalised approach. Within our organisation, the non-drug intervention recommendations are paired with available online classes and programmes, increasing the accessibility and capability for people to meet their chosen goals with evidence-based interventions. Experts and health coaches running the classes and programmes can use the information represented in the Pathway tables, along with an implementation guide, to help participants identify and prioritise their own health goals (or needs) and choose from a variety of interventions based on their personal preferences. Fundamental to this approach of non-drug interventions is an individual's ability to identify an area of perceived need, consider their goals, identify activities they like to do and structure a process for easy and consistent adherence. Future iterations of the Pathway will also focus on specific health conditions. Ultimately, our intention is that the Pathway is integrated into a digital health solution to better guide service users with evidence-based information on what activities would best meet their healthy ageing needs.

4.2.2. Health and Social Care Provider Prescription of Non-Drug Interventions

While most of the non-drug interventions that improve health and wellbeing as we age can be readily self-selected and implemented, healthcare and social care providers need to be able to close the gap between healthcare and wellness. To promote the demonstrable benefits for people engaging in non-drug interventions, clear guidance and training are required to help healthcare providers better understand and effectively prescribe interventions such as exercise, nutritional improvements, stress management and cessation of unhealthy habits. However, while training in aspects of lifestyle medicine, nutrition, mental health and wellbeing, and social prescribing are increasingly available to health and social care providers, they come at additional cost for providers themselves in terms of

finances, study and time. In addition, assessment and certification on standardised and evidence-based non-drug interventions and delivery are not always available, resulting in often discordant advice from different providers. Social prescribing is increasingly mentioned as a potential solution; however, the evidence to date to demonstrate significant benefit is not yet robust [190–192].

Our next steps in developing the Pathway are to develop the specific non-drug intervention Pathways for broader condition groups in mental health, cognitive, cardiovascular and metabolic health which can be offered as adjunctive to usual healthcare provision. The next aim for the current healthy ageing Pathway is technological integration into digital healthy ageing platforms and social prescribing systems so that providers and participants can digitally interact with the Pathway to facilitate non-drug intervention recommendations based on needs and goals. In the “Decade of Healthy ageing baseline report, the World Health Organization noted the lack of data on healthy ageing in older populations and how that perpetuates the invisibility of the older person [1]. Essential to digital integration of the Pathway are data collection around engagement and outcomes of older people with non-drug interventions. Given the relative lack of published studies focused on older adults, compared to adult population studies, generating larger data sets from older people engaging with healthy ageing interventions brings the opportunity to identify factors to be able to offer more personalised recommendations. While the version of the Pathway described within this paper is intended for use by professionals and forms the basis of the Pathway to be embedded into our organisation’s healthy ageing platform, a layperson version of the Pathway will also be developed to help individuals in self-selection of non-drug interventions. Further research and development will focus on the integration of the Pathway digitally and testing for appropriate implementation strategies as well as further development of the condition-specific Pathways.

5. Conclusions

The ultimate purpose of the Systematic Wellness Intervention Pathway for Healthy Ageing is to help older people improve their healthy ageing outcomes by providing a clear approach to selecting the most appropriate non-drug interventions. By taking a systematic and more directive approach, it is intended that the Pathway will provide people and providers with a simple and effective way to select the most appropriate interventions or activities based on health goals for a personalised approach to optimising healthy ageing outcomes as well as revising intervention choices over time with progress or life changes.

In order to accelerate engagement with non-drug interventions that can have measurable impacts on healthy ageing, a systematised approach to assessment, selection, engagement, and monitoring benefits and outcomes needs to be accessible and scalable. If non-drug prescription formularies, pathways and accessible delivery mechanisms could be integrated into the health and social care systems as rigorously as pharmaceutical and surgical interventions, non-drug interventions have the potential to influence far wider benefits if prescribers have the evidence-based backing and confidence to recommend them. When conducted in combination with carefully collected personalised data to include needs, goals and preferences, it is intended that the Systematic Wellness intervention Pathway could be a step forward in operationalising and delivering non-drug interventions in an accessible and scalable way to enable older people as individuals to live well for longer, as well as better integrate non-drug intervention delivery as supplementary to conventional health and social care delivery.

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