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i-REBOUND Cook Well After Stroke: Co-Designing a Culinary Nutrition Programme for Australian Stroke Survivors

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ABSTRACT

Introduction: Stroke is a life-altering event for survivors. While improving diet quality is associated with reduced stroke risk, the post-stroke effects often make meal preparation difficult. There is a lack of published research on culinary nutrition programmes tailored to stroke survivors' recovery journey. This study outlines the co-design process of a culinary nutrition programme aimed at promoting the uptake of a Mediterranean-style diet for people who have had a stroke.

Methods: Utilising the Integrated Knowledge Translation (IKT) framework, exploratory interviews and focus groups were conducted with an IKT team comprising six multidisciplinary researchers and three lived experience research partners. A further six stroke survivors and seven stroke clinicians participated in focus groups as end-users.

Results/Discussions: The resulting intervention prototype, titled *Cook Well After Stroke*, includes a recipe book supplemented with additional programme elements. The IKT team identified critical gaps in current stroke care, particularly during the transition from hospital rehabilitation to home, and key components for the *Cook Well After Stroke* Programme, including intervention name, overarching principles, recipe guidelines and supporting resources. The recipe book was iteratively developed with stroke survivors, incorporating feedback and suggestions for improvement into the final prototype.

Conclusion: This study represents an innovative project to develop a *Cook Well After Stroke* Programme tailored specifically for Australian stroke survivors, which may contribute to secondary stroke prevention strategies. This project has developed a prototype and identified additional elements required for the further advancement and completion of the *Cook Well After Stroke* Programme. Further research is needed to adapt the intervention prototype for a more diverse range of stroke survivors and to evaluate the feasibility, acceptability and accessibility of this co-designed programme.

Summary

- The primary barriers to healthy eating after a stroke are post-stroke effects, particularly fatigue and the lack of evidence-informed resources for self-management at home.
- The stroke journey is individualised and unique to each stroke survivor, making strategies tailored to specific needs and challenges essential for secondary stroke prevention.
- The *Cook Well After Stroke* programme includes a co-designed recipe book and additional programme elements, which may offer self-paced support to stroke survivors.

1 | Introduction

A stroke is a life-changing event for survivors [1, 2]. The impact of stroke requires survivors to readjust their skills and capacity for performing activities of daily living, which can affect their independence and quality of life [1, 2]. Additionally, people who have had a stroke face a heightened risk of recurrent stroke [3, 4], with one-fifth of stroke survivors experiencing a second stroke within 5 years of the initial stroke [4]. These recurrent strokes account for up to 30% of all stroke events and often result in more disabling, fatal and costly outcomes compared to first-ever strokes [3, 4].

Synthesised research has shown that diet quality is a key modifiable risk factor for stroke prevention, and it directly affects other stroke risk factors [5–7]. Various dietary interventions have demonstrated potential in mitigating cardiovascular risk factors [5–9]. For instance, the Mediterranean-style diet has strong evidence supporting its ability to improve lipid profiles and blood pressure, which are crucial for reducing stroke risk [8]. A recent large-scale trial ($n = 20{,}995$; mean follow-up of 4.74 years) also demonstrated that sodium reduction significantly decreases the rates of stroke, major adverse cardiovascular events and mortality among stroke survivors [9]. Despite clear dietary recommendations, a recent study of Australian stroke survivors ($n = 89$) found poor diet quality, with a mean score of 30.5 ± 9.9 out of 73 in the Australian Recommended Food Score (ARFS) [10]. Excessive sodium (> 2000 mg/day) was consumed in approximately half of the participants, exceeding the Nutrient Reference Values for Australia and New Zealand, potentially contributing to secondary stroke risk. Additionally, more than 80% of the participants under-consumed nutrients protective against secondary stroke risk, such as fibre and omega-3 fatty acids. These findings indicated the need for additional dietary intervention programmes to support the implementation of a Mediterranean-style diet for secondary stroke prevention.

Culinary nutrition, defined as the combination of cooking skills and nutrition knowledge, supports individuals in creating nutritious and fulfilling meals. It encompasses two broad categories of skills: (1) cooking skills, which involve hands-on food preparation techniques, and (2) food skills, which include nutrition knowledge, meal planning, shopping, budgeting, resourcefulness and label reading [11, 12]. A recent scoping review identified only three culinary nutrition programmes for stroke survivors worldwide (United States and Taiwan) [13–18]. These programmes demonstrated positive effects on participants' dietary intake and quality of life following short-term interventions (6–12 weeks) [14–17]. Among the identified studies, only one programme from the United States [15, 16] offered Mediterranean diet nutrition education along with hands-on implementation practice for meal preparation and grocery shopping; none, however, were developed through a co-design process or were conducted in Australia [13–18].

Evidence indicates that research findings are often underutilised, even when proven effective and affordable [19, 20]. The primary barriers include insufficient consideration of real-world factors influencing intervention uptake and incomplete documentation of implementation strategies [19, 20]. These issues can be mitigated by co-designing interventions with end-users (those using and/or delivering the service) and tailoring implementation strategies to their perceived facilitators and barriers. Co-design engages people with lived experience and other end-users (including health care practitioners) in the programme development [21]. The Stroke Recovery and Rehabilitation Roundtable (SRRR) also recommended using co-design research to improve the feasibility and uptake of stroke interventions [22].

Our previous i-REBOUND research involved co-designing nutrition and physical activity resources for a secondary stroke prevention trial. Building on this foundation, this study presents the process of co-designing a culinary nutrition programme with stroke survivors and stroke rehabilitation clinicians, aiming to develop the *Cook Well After Stroke* Programme to support healthy eating among people who have had a stroke.

2 | Methods

This iterative co-design study was guided by the generative co-design framework for healthcare innovation [23] and the Integrated Translation Knowledge (IKT) model [24] (Figure 1). This study was approved by the ethics committee of both the Hunter New England Local Health District (Reference: 2023/ETH00044) and the University of Newcastle (Reference: H-2023-0045). The research flow is outlined in Figure 1 [25, 26].

2.1 | Recruitment

2.1.1 | The IKT Team ($n = 9$)

The members of the IKT team (C. T. C., L. M.-W., C. E., N. A. L., H. J., J. D., C. K., B. H. and A. P.) were purposively recruited through professional networks to encompass a broad range of professions within the stroke care field. All members provided consent to participate. The team comprised six multidisciplinary stroke researchers, including dietitians (C. T. C., L. M.-W. and A.P.), physiotherapists (C. E. and H. J.) and an occupational therapist (N. A. L.), as well as three lived experience research partners (J. D., C. K. and B. H.).

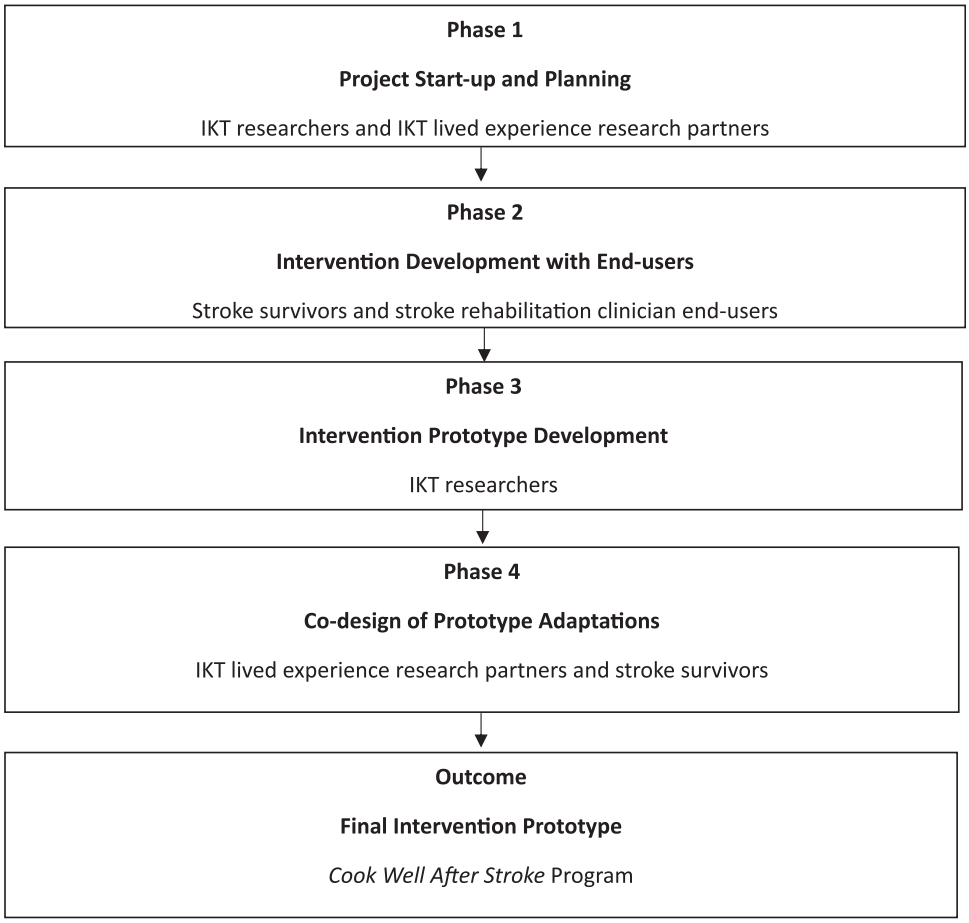

FIGURE 1 | Flow chart of the Integrated Knowledge Translation (IKT) co-design process.

2.1.2 | End-Users ($n = 13$)

The end-users recruited were stroke survivors ($n = 6$) and healthcare professionals with experience working with people who have had a stroke, including dietitians ($n = 4$), occupational therapist ($n = 1$), speech pathologist ($n = 1$) and physiotherapist ($n = 1$). End-users with diverse experience, and from various geographical locations (metropolitan, regional and rural) were recruited to capture perspectives from a broad range of backgrounds. They were recruited through professional networks, from previous related studies, by word of mouth and by advertisements sent via the stroke volunteer register. Consent was obtained using the approved consent form.

2.2 | Phase 1: Project Start-Up and Planning

Phase 1 utilised the generative co-design framework for healthcare innovation [23] to identify perceived gaps in stroke care and determine key intervention components. The research team developed interview questions (Supporting Information S1) based on their prior research experience and clinical expertise in stroke care. The IKT team ($n = 9$) participated in iterative exploratory meetings conducted using a mix of face-to-face and teleconference meetings, either individually or in small groups. While meetings were not recorded, all team members consented to note-taking.

Building on established healthcare implementation research and behavioural change principles [23, 27], we employed barrier and facilitator analysis, which is commonly used in our previous co-designed stroke research and other culinary nutrition-related studies [25, 26, 28]. Following these initial meetings and interviews, the full IKT team convened for a focus group to establish potential research directions. This discussion explored the facilitators and barriers (Supporting Information S2) to cooking and meal preparation among stroke survivors, drawing on participants' lived experiences.

2.3 | Phase 2: Intervention Development With End-Users

The general idea and concept of the intervention prototype were developed through two focus groups with end-users, one with stroke survivors ($n = 6$) and another with stroke clinicians ($n = 7$). Both focus groups were conducted online via Zoom videoconference [29], as preferred by participants who were in multiple geographical regions. Participants were guided by a series of questions (Supporting Information S3) and encouraged to continue sharing their thoughts on the project via email. The questions (Supporting Information S3) were developed based on the guidance of the Template for Intervention Description and Replication (TIDieR) [20], as recommended by the SRRR [22]. However, only questions relevant to the current stage of

programme development were included, considering participants' cognitive load during the focus group. All end-users provided consent for video recording and note-taking for the purpose of research data synthesis.

2.4 | Phase 3: Intervention Prototype Development

The essential elements of intervention prototype development were collected from Phases 1 and 2 and synthesised through meetings within the IKT researchers ($n = 9$). The intervention prototype, the *Cook Well After Stroke* recipe book and its content material was then developed. Throughout the development process, several visual exemplars were sent to stroke survivors via emails to gather feedback on their user experiences and preferences. Participants were encouraged to respond as many times as they wished via email or share their thoughts on other's responses within the same email thread.

2.5 | Phase 4: Co-Design of Prototype Adaptations

An online focus group was conducted with stroke survivors ($n = 3$) and the IKT lived experience research partners ($n = 3$) to revise and review the *Cook Well After Stroke* recipe book. The focus group was conducted online via Zoom teleconference [27]. All participants provided consent for video recording and note-taking for the purpose of research data synthesis. The discussion was guided to determine feedback on the recipe book's general principles, content categorisation, accessible word choices, content layout and nutrition education resources. The findings were then incorporated into the development of the final intervention prototype.

2.6 | Data Collection, Analysis and Synthesis

Qualitative data were collected throughout the project, and all data were collected with the consent of the participants and IKT team members. The outcome synthesis process was guided by the principles of the participatory design framework, and the following methods were employed to enhance research rigour [30]. The data collection and synthesis processes employed the researchers' reflection method [31] in conjunction with iterative and participatory synthesis involving stroke survivors and/or clinicians [32]. All data were collected using the approved methods from the ethics committee. C. T. C. initially analysed the collected data by iteratively reading and reflecting on the transcripts to identify essential themes for prototype design based on their professional understanding of the project. C. T. C. then compared these reflections with field notes and the transcripts, to generate a preliminary summary. This summary was discussed with the IKT team and further refined based on the team's expertise and lived experience with stroke care and recovery. These discussions were conducted to ensure the analysis is grounded by incorporating perspectives from both clinicians and stroke survivors. The IKT team clarified details or directions with participants via email when necessary. The process was stopped when the IKT team thoroughly understood the perspectives of stroke survivors, ensuring that data saturation was reached. The methodology and findings were also reported in a detailed and consistent manner, allowing for further exploration and/or replication.

3 | Results

3.1 | Phase 1: Project Start-Up and Planning

Through iterative interviews and focus groups with the IKT team, we identified four key aspects of stroke recovery in Australia that guided the intervention prototype development. It included the typical recovery journey and available care options, perceived gaps in stroke care, facilitators and barriers in post-stroke eating and cooking, and strategies for effective collaboration with stroke survivors (Supporting Information S4). The demographic details of participants were summarised in Supporting Information S5.

The key gaps identified in Australian stroke care exist between post-discharge rehabilitation and home care. While various care options are available during hospital stays and through rehabilitation services (e.g., community stroke programmes and outpatient dietitian consultations), findings from exploratory interviews (Supporting Information S4) highlight a significant lack of dietary and culinary nutrition support once stroke survivors are discharged. A tailored intervention that considers the individualised recovery journeys of stroke survivors and ensures substantial lived experience involvement was identified as essential for successful project planning. Experts interviewed emphasised the critical need for additional support to help stroke survivors manage culinary nutrition tasks (e.g., effectively utilising available tools, cooking within physical capacity) while addressing post-stroke challenges such as fatigue, limited mobility and swallowing difficulties.

Key facilitators for inclusion in the intervention prototype include the effective translation of Mediterranean-style dietary principles, motivation to improve well-being, provision of cost-effective stroke-specific cooking and eating strategies, and accommodation of post-stroke effects.

3.2 | Phase 2: Intervention Development With End-Users

Analysis of the focus groups led to the development of three main themes: the setting or mode of delivery for a culinary nutrition programme, the need for an accessible stroke recipe book, as well as supporting culinary nutrition resources. End-users identified the name *Cook Well After Stroke* as clear and straightforward for the intervention prototype. The resulting prototype includes a recipe book and additional programme elements. Stroke survivors expressed interest in more accessible recipes or recipe books. They shared their experiences with using recipe books to plan and prepare meals and noted the lack of an evidence-informed, Mediterranean-style diet-accessible recipe book specifically designed for stroke survivors in Australia. Several additional programme elements were identified to support the tailoring of the intervention to individuals' home environments and recovery journeys. Stroke survivors'

TABLE 1 | Stroke survivors' suggestions for Cook Well After Stroke Programme design.

***Cook Well After Stroke* Programme**	**Phase 2 findings summary**
Recipe book	*Layout* • Use aphasia-friendly plain English. • Use an A4 upright book design. *Format* • Separate ingredient and equipment list. • Use tick boxes to facilitate recipe following. *Content* • Address challenges regarding cooking for one person and for a household. • Minimise recipe ingredients and instructions. • Incorporate Mediterranean-style nutrition principles. • Accommodate post-stroke cooking needs. *Resources facilitating post-stroke meal preparation* • Shopping list and meal planner. • Practical strategies for meal preparation and healthy eating after stroke.
Additional programme elements	*Format or mode of delivery* • A self-paced programme was deemed optimal as it accommodates post-stroke fatigue, can be personalised to individual recovery priorities, and is accessible across all geographical locations. • Although a small number of stroke survivors preferred face-to-face settings, the rigid scheduling of such sessions was anticipated to contribute to greater cognitive fatigue compared with self-paced resources. *Tailoring* • Tailor the intervention to individuals' home environments and recovery journeys. • For example, considering individuals' kitchen equipment availability and post-stroke capacity for performing kitchen tasks. *Support* • Incorporate social elements or peer support from those who have experienced a stroke.

suggestions for *Cook Well After Stroke* Programme design are summarised in Table 1, with themes and verbatim evidence outlined in Supporting Information S6.

3.3 | Phase 3: Intervention Prototype Development

Table 2 presents the essential components derived from Phases 1 and 2 of the study, illustrating their integration into the development of the intervention prototype. The table provides a detailed account of how feedback from end-users was incorporated to refine key elements such as the intervention's name, overarching principles, recipe guidelines and supporting resources. This feedback was important in ensuring that the intervention prototype aligned with user needs and preferences, thereby enhancing its relevance, accessibility and practicality in supporting stroke survivors' dietary practices and health outcomes. The ongoing co-design process will continue in upcoming research to refine the intervention prototype further.

3.4 | Phase 4: Co-Design of Prototype Adaptations

In this focus group, participants (three lived experience research partners and three stroke survivors) provided valuable insights for adapting the *Cook Well After Stroke* Recipe Book (Supporting Information S7). Participants expressed positive feedback on most aspects of the intervention prototype, including the recipe book's overarching principles, content categorisation, layout and the relevance of nutrition education resources. They found the recipe book to be generally easy to understand and use, appreciating the inclusion of essential resources to support eating and cooking after a stroke. The structure of the recipe book, designed to accommodate different cooking needs, was particularly well-received. Several suggestions were also made to improve the accessibility of the intervention prototype. These included using a pictorial version of the Healthy Plate Model, removing preparation time suggestions, and adding glossaries for cooking terminology (e.g., stir-dry, boil) and kitchen equipment (e.g., saucepan, ring-pull can opener).

TABLE 2 | Essential elements perceived by end-users and their translation into the intervention prototype.

Themes	Perceived essential elements by end-users	Translation into intervention prototype
Intervention name	A simple and explicit name, such as *Cook Well After Stroke*.	The recipe book was named *Cook Well After Stroke*.
Overarching principles	• Aimed to improve the culinary nutrition skills and knowledge of stroke survivors. • Application of Mediterranean-style diet principles. • An accessible layout, including plain English, an aphasia-friendly design, and an A4 upright format. • Use of positive motivational strategies.	• All content was designed to move beyond recipe-driven cooking and encouraged users to substitute ingredients based on personal circumstances [33]. Each recipe included suggestions for alternative ingredients to help users apply the recipe concepts repeatedly and enhance meal variety. • All recipes were designed to support adherence to a Mediterranean-style diet. • The content was created using aphasia-friendly language and font styles (Sans Serif, size 14 and above, with important text in bold and headings in colour), in accordance with the Stroke Association Accessible Information Guidelines [34]. • The recipe book was designed in an A4 upright layout. • All recommendations and motivational strategies were curated using the concepts of culinary nutrition education planning framework [33], with a focus on 'eating well' and 'feeling good', rather than simply adhering to strict dietary restrictions. The aim was to promote sustainable and enjoyable eating habits aligning with overall well-being and long-term health outcomes.
Recipe guidelines	• Inclusion of recipes for both individual and household meals. • Incorporation of nutrition principles specific to stroke survivors. • Accessible recipe layout (e.g., separating ingredient lists from equipment lists).	• Recipes were categorised into 'Cooking for One' and 'Cooking for More,' including options for individual meals as well as meals for households or for preparing in advance. • Each recipe featured a 'Hints and Hacks' section, providing stroke-specific tips from lived experience research partners for individuals who preferred a softer diet (due to post-stroke fatigue) or who faced challenges with limited mobility. Discussion arose regarding the need to include texture-modified diet strategies; however, the IKT team focused on strategies that are not clinically restricted to texture-modified diets, considering safety issues related to meal preparation at home. Instead, stroke survivors with severe clinical dysphagia are advised to consult their clinician for dietary and cooking advice. • Each recipe adhered to the principles of the Mediterranean-style diet [35] and the Australian Guide to Healthy Eating [36], providing suggestions for creating nutritionally complete meals guided by the Healthy Plate Model [37]. • Each recipe included a single ingredient list and a single equipment list, presented in a checklist format to facilitate readability. • Each recipe features fewer than 10 ingredients and instructions, requiring minimal cooking skills, measurement and equipment.
Supporting resources	• Shopping list • Meal Planner • Practical strategies for meal preparation, along with tools to enhance diet quality, including accessible explanations of Mediterranean-style diet principles.	• A shopping list and meal planner were included in the recipe book. • Nutrition education materials, developed by the IKT team with input from end-users, encompassed key concepts of the Mediterranean-style diet, strategies for eating and cooking after a stroke, and guidance on constructing nutritionally balanced meals using the Healthy Plate Model [37].

4 | Discussion

This study outlined the co-design process, guided by the IKT framework, to develop the *Cook Well After Stroke* Programme in collaboration with stroke survivors and clinicians.

Research indicates that a higher frequency of home cooking, combined with greater skills in culinary nutrition tasks, is associated with improved diet quality [38–41]. Moreover, convenience meal options, including ready-made meals and commercial meal kits, often contain high levels of sodium, increasing the risk for secondary cardiovascular complications [9, 42, 43]. Therefore, culinary nutrition skills building for post-stroke meal preparation is important for secondary stroke prevention. The consumer-perceived essential aspects of accessible stroke culinary nutrition align with the behavioural change motivational features proposed by Fredericks et al. [33] and were incorporated into the prototype development (e.g., home environment and peer support). This approach aimed to effectively translate intervention experiences into real-life settings, an aspect also considered important by end-users. For instance, the *Cook Well After Stroke* Programme encourages users to move beyond recipe-driven cooking [33], and utilises recipe concepts with alternative ingredients based on availability and preference. Additionally, the programme prompts users to perform culinary nutrition tasks within their own home environment [33], thereby facilitating problem-solving in their real-life situations.

Other key facilitators for stroke-specific culinary nutrition interventions were also identified, including the simplification of Mediterranean-style dietary principles and the incorporation of positive motivation and social dimensions into the dietary change process. By recognising the emotional significance of food and the motivation to improve well-being, interventions can better resonate with users [33, 44]. The incorporation of social support and adaptive tools can also empower individuals, fostering greater autonomy in meal preparation and encouraging participation in cooking activities. However, as highlighted, affordability and fatigue remain significant barriers to accessing necessary resources and support.

Consistent with the lack of quality culinary nutrition interventions in existing literature and digital resources, end-users suggested the need for an accessible stroke recipe book that offers simple translations of Mediterranean-style diet principles into household options, accounting for post-stroke complications for the Australian community [13, 18]. Existing stroke-specific recipe books often present several limitations: they employ complex language and instructions, lack evidence-based or evidence-informed information (frequently including inaccurate claims or recommending strict dietary restrictions irrelevant to stroke recovery), rely on ingredients not commonly available in Australia, and fail to address practical challenges associated with post-stroke meal preparation, such as fatigue, one-handed cooking and the preferences for softer textures.

The development of the *Cook Well After Stroke* Programme represents a significant step forward in addressing these identified needs. The collaborative approach guided by the IKT framework, involving focus groups with stroke survivors and clinicians, ensured that the intervention was informed by lived experience. The recipe book's emphasis on flexibility, simplicity, and clear communication aligns with the needs of stroke survivors, particularly those experiencing cognitive challenges, aphasia or fatigue. Furthermore, the inclusion of sections like 'Hints and Hacks' provides practical support that addresses common post-stroke challenges, enhancing the overall feasibility of the intervention. Participants' suggestions for improving accessibility, such as incorporating pictorial representations of dietary principles and glossaries for cooking terminology, highlight the importance of ongoing feedback in refining health interventions. These adaptations reflect an understanding that the cooking process can be daunting for stroke survivors, and addressing potential barriers to comprehension and execution is vital for promoting adherence to the intervention.

Several limitations should be considered when interpreting the study process described in this research. First, there may be a lack of diversity among the recruited end-users. Specifically, stroke survivors with more severe post-stroke effects (e.g., dysphagia, severe aphasia or severe visual impairment), those from culturally and linguistically diverse backgrounds, recent stroke survivors (within the past 3 months) and carers were not included in this research. Although the recipe book includes strategies for preparing meals suitable for those living with swallowing difficulties during times of fatigue, it is not designed or appropriate for individuals with clinically diagnosed dysphagia who require a strictly texture-modified diet for all meals and fluids. Consequently, the findings and preferred intervention prototype may not be representative of the broader population of stroke survivors. Additionally, the feedback from end-users was also not anonymous, which may have influenced responses or introduced bias due to group dynamics. Further research involving a larger and more diverse participant pool would be beneficial to confirm the essential elements identified in this study. Second, there is limited data in the field of stroke and culinary nutrition to support a comprehensive appraisal of the research and/or prototype. Additionally, the analysis and synthesis of the data relied heavily on the researchers' reflections, with iterative participatory synthesis involving stroke survivors and clinicians. Therefore, three potential biases (researcher bias, participant selection bias and evaluation approach bias) should be acknowledged.

Despite these limitations, the research included a group of stroke survivors from various geographical locations (urban, rural and regional), diverse living and meal preparation situations, different stages and types of strokes, and a range of post-stroke effects such as unilateral weakness, fatigue and aphasia. Additionally, a wide range of stroke clinicians working in various settings (including stroke rehabilitation programmes, hospitals, secondary rehabilitation clinics, community settings and research environments) were recruited.

5 | Conclusion

This research sought to bridge the gap between theoretical Mediterranean-style diet principles and practical intervention experiences by creating accessible resources for stroke survivors in real-life settings, addressing key concerns raised by end-

users. This outcome was a *Cook Well After Stroke* Programme, including a recipe book based on a Mediterranean-style diet, adapted specifically for Australian stroke survivors. Further research is needed to assess the feasibility, acceptability and accessibility of these co-designed resources.

Author Contributions

Conceptualisation: Chian Thong (Nicole) Chun, Lesley MacDonald-Wicks, Coralie English, Natasha A. Lannin, Heidi Janssen, Julie Davey, Clive Kempson, Bev Hopper and Amanda Patterson. Methodology: Chian Thong (Nicole) Chun, Lesley MacDonald-Wicks, Coralie English and Amanda Patterson. Validation: Lesley MacDonald-Wicks, Coralie English, Natasha A. Lannin and Amanda Patterson. Formal analysis: Chian Thong (Nicole) Chun. Writing – original draft preparation: Chian Thong (Nicole) Chun. Writing – review and editing: Lesley MacDonald-Wicks, Coralie English, Natasha A. Lannin and Amanda Patterson. Supervision: Lesley MacDonald-Wicks, Coralie English, Natasha A. Lannin and Amanda Patterson. All authors have read and agreed to the published version of the manuscript.

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Ethics Statement

The research was approved by both the Hunter New England Local Health District (Reference: 2023/ETH00044) and the University of Newcastle (Reference: H-2023-0045) Ethics Committees.

Consent

All end-users (i.e., participants) provided written informed consent statements in accordance with the requirement of Hunter New England Local Health District (Reference: 2023/ETH00044) and the University of Newcastle (Reference: H-2023-0045) Ethics Committees.

Conflicts of Interest

The authors declare no conflicts of interest.

Transparent Peer Review

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jhn.70045.

Data Availability Statement

The authors have nothing to report.

References

1. S. Chohan, P. Venkatesh, and C. How, "Long-Term Complications of Stroke and Secondary Prevention: An Overview for Primary Care Physicians," *Singapore Medical Journal* 60, no. 12 (2019): 616–620.

2. Stroke Recovery Association NSW, Living Well After Experiencing a Stroke (2022), https://strokensw.org.au/about-stroke/living-well-after-stroke/.

3. G. J. Hankey, "Secondary Stroke Prevention," *Lancet Neurology* 13, no. 2 (2014): 178–194.

4. V. Rücker, P. U. Heuschmann, M. O'Flaherty, et al., "Twenty-Year Time Trends in Long-Term Case-Fatality and Recurrence Rates After Ischemic Stroke Stratified by Etiology," *Stroke* 51, no. 9 (2020): 2778–2785.

5. E. A. O'Connor, C. V. Evans, M. C. Rushkin, N. Redmond, and J. S. Lin, "Behavioral Counseling to Promote a Healthy Diet and Physical Activity for Cardiovascular Disease Prevention in Adults With Cardiovascular Risk Factors: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force," *Journal of the American Medical Association* 324, no. 20 (2020): 2076–2094.

6. S. Zheng and B. Yao, "Impact of Risk Factors for Recurrence After the First Ischemic Stroke in Adults: A Systematic Review and Meta-Analysis," *Journal of Clinical Neuroscience* 60 (2019): 24–30.

7. X. Zeng, A. Deng, and Y. Ding, "The INTERSTROKE Study on Risk Factors for Stroke," *Lancet* 389, no. 10064 (2017): 35.

8. C. English, L. MacDonald-Wicks, A. Patterson, J. Attia, and G. J. Hankey, "The Role of Diet in Secondary Stroke Prevention," *Lancet Neurology* 20, no. 2 (2021): 150–160.

9. B. Neal, Y. Wu, X. Feng, et al., "Effect of Salt Substitution on Cardiovascular Events and Death," *New England Journal of Medicine* 385, no. 12 (2021): 1067–1077.

10. K. Zacharia, E. Ramage, M. Galloway, et al., "The Diet Quality of Australian Stroke Survivors in a Community Setting," *Cerebrovascular Diseases* 53, no. 2 (2023): 184–190.

11. R. C. Asher, V. A. Shrewsbury, T. Bucher, and C. E. Collins, "Culinary Medicine and Culinary Nutrition Education for Individuals With the Capacity to Influence Health Related Behaviour Change: A Scoping Review," *Journal of Human Nutrition and Dietetics* 35, no. 2 (2022): 388–395.

12. F. Lavelle, L. McGowan, L. Hollywood, et al., "The Development and Validation of Measures to Assess Cooking Skills and Food Skills," *International Journal of Behavioral Nutrition and Physical Activity* 14, no. 1 (2017): 118.

13. R. D. Russell, L. J. Black, and A. Begley, "Nutrition Education Programs for Adults With Neurological Diseases Are Lacking: A Scoping Review," *Nutrients* 14, no. 8 (2022): 1577.

14. S. C. Lin, K. H. Lin, Y. C. Tsai, and E. C. Chiu, "Effects of a Food Preparation Program on Dietary Well-Being for Stroke Patients With Dysphagia: A Pilot Study," *Medicine* 100, no. 25 (2021): e26479.

15. A. Towfighi, E. M. Cheng, V. A. Hill, et al., "Results of a Pilot Trial of a Lifestyle Intervention for Stroke Survivors: Healthy Eating and Lifestyle After Stroke," *Journal of Stroke and Cerebrovascular Diseases* 29, no. 12 (2020): 105323.

16. V. A. Hill, B. G. Vickrey, E. M. Cheng, et al., "A Pilot Trial of a Lifestyle Intervention for Stroke Survivors: Design of Healthy Eating and Lifestyle After Stroke (HEALS)," *Journal of Stroke and Cerebrovascular Diseases* 26, no. 12 (2017): 2806–2813.

17. J. H. Rimmer, C. Braunschweig, K. Silverman, B. Riley, T. Creviston, and T. Nicola, "Effects of a Short-Term Health Promotion Intervention for a Predominantly African-American Group of Stroke Survivors," *American Journal of Preventive Medicine* 18, no. 4 (2000): 332–338.

18. C. T. Chun, L. MacDonald-Wicks, C. English, N. A. Lannin, and A. Patterson, "Scoping Review of Available Culinary Nutrition Interventions for People With Neurological Conditions," *Nutrients* 16, no. 3 (2024): 462.

19. P. Glasziou, S. Straus, S. Brownlee, et al., "Evidence for Underuse of Effective Medical Services Around the World," *Lancet* 390, no. 10090 (2017): 169–177.

20. T. C. Hoffmann, P. P. Glasziou, I. Boutron, et al., "Better Reporting of Interventions: Template for Intervention Description and Replication (TIDieR) Checklist and Guide," *BMJ* 348 (2014): g1687.

21. B. S. J. Tay, D. N. Cox, G. D. Brinkworth, et al., "Co-Design Practices in Diet and Nutrition Research: An Integrative Review," *Nutrients* 13, no. 10 (2021): 3593.

22. M. F. Walker, T. C. Hoffmann, M. C. Brady, et al., "Improving the Development, Monitoring and Reporting of Stroke Rehabilitation Research: Consensus-Based Core Recommendations From the Stroke Recovery and Rehabilitation Roundtable," *International Journal of Stroke* 12, no. 5 (2017): 472–479.

23. M. Bird, M. McGillion, E. M. Chambers, et al., "A Generative Co-Design Framework for Healthcare Innovation: Development and Application of an End-User Engagement Framework," *Research Involvement and Engagement* 7, no. 1 (2021): 12.

24. L. Boland, A. Kothari, C. McCutcheon, and I. D. Graham, "Building an Integrated Knowledge Translation (IKT) Evidence Base: Colloquium Proceedings and Research Direction," *Health Research Policy and Systems* 18, no. 1 (2020): 8.

25. E. R. Ramage, M. Burke, M. Galloway, et al., "Fit for Purpose. Co-Production of Complex Behavioural Interventions. A Practical Guide and Exemplar of Co-Producing a Telehealth-Delivered Exercise Intervention for People With Stroke," *Health Research Policy and Systems* 20, no. 1 (2022): 2.

26. K. Zacharia, A. J. Patterson, C. English, et al., "i-Rebound After Stroke-Eat for Health: Mediterranean Dietary Intervention Co-Design Using an Integrated Knowledge Translation Approach and the TIDieR Checklist," *Nutrients* 13, no. 4 (2021): 1058.

27. L. Atkins, J. Francis, R. Islam, et al., "A Guide to Using the Theoretical Domains Framework of Behaviour Change to Investigate Implementation Problems," *Implementation Science* 12, no. 1 (2017): 77.

28. R. C. Asher, V. A. Shrewsbury, B. Innes, A. Fitzpatrick, S. Simmonds, and C. E. Collins, "Designing the Food and Lifestyle Information Program (FLIP) Culinary Nutrition Intervention for Adults With Mild-to-Moderate Intellectual Disability," *Journal of Human Nutrition and Dietetics* 37, no. 4 (2024): 1109–1122.

29. Zoom Video Communications Inc., Zoom (Version 5.0) (2020).

30. Inclusive Design Research Centre, Co-Designing Synthesis: Community-Led Co-design Kit (n.d.).

31. E. Sanders and E. Brandt, A Framework for Organizing the Tools and Techniques of Participatory Design (2010).

32. Inclusive Design Research Centre, Community-Led Co-design Kit (n.d.), https://co-design.inclusivedesign.ca/.

33. L. Fredericks, P. A. Koch, A. Liu, L. Galitzdorfer, A. Costa, and J. Utter, "Experiential Features of Culinary Nutrition Education That Drive Behavior Change: Frameworks for Research and Practice," *Health Promotion Practice* 21, no. 3 (2020): 331–335.

34. Stroke Association, Accessible Information Guidelines: Making Information Accessible for People With Aphasia: Stroke Association (2012), https://www.stroke.org.uk/sites/default/files/accessible_information_guidelines.pdf1_.pdf.

35. K. Zacharia, A. J. Patterson, C. English, and L. MacDonald-Wicks, "Feasibility of the AusMed Diet Program: Translating the Mediterranean Diet for Older Australians," *Nutrients* 12, no. 4 (2020): 1044.

36. Eat For Health, Australian Guide to Healthy Eating: Australian Government (2013), accessed August 24, 2024, https://www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating.

37. NSW Government, Healthy Plate and Serving Size (n.d.), https://www.activeandhealthy.nsw.gov.au/assets/images/healthy-ageing/Healthy-plate-and-serving-sizes.pdf.

38. J. A. Wolfson, C. W. Leung, and C. R. Richardson, "More Frequent Cooking at Home Is Associated With Higher Healthy Eating Index-2015 Score," *Public Health Nutrition* 23, no. 13 (2020): 2384–2394.

39. J. A. Wolfson and S. N. Bleich, "Is Cooking at Home Associated With Better Diet Quality or Weight-Loss Intention?," *Public Health Nutrition* 18, no. 8 (2015): 1397–1406.

40. L. McGowan, M. Caraher, M. Raats, et al., "Domestic Cooking and Food Skills: A Review," *Critical Reviews in Food Science and Nutrition* 57, no. 11 (2017): 2412–2431.

41. R. C. Asher, T. Jakstas, J. A. Wolfson, et al., "Cook-EdTM: A Model for Planning, Implementing and Evaluating Cooking Programs to Improve Diet and Health," *Nutrients* 12, no. 7 (2020): 2011.

42. K. van der Horst, T. A. Brunner, and M. Siegrist, "Ready-Meal Consumption: Associations With Weight Status and Cooking Skills," *Public Health Nutrition* 14, no. 2 (2011): 239–245.

43. A. A. Gibson and S. R. Partridge, "Nutritional Qualities of Commercial Meal Kit Subscription Services in Australia," *Nutrients* 11, no. 11 (2019): 2679.

44. S. Michie, M. Richardson, M. Johnston, et al., "The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions," *Annals of Behavioral Medicine* 46, no. 1 (2013): 81–95.

Supporting Information

Additional supporting information can be found online in the Supporting Information section.